2020 Lake Pend Oreille Predator Management Program

Annual Project Update

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April 2021

TABLE OF CONTENTS

LIST OF FIGURES

ABSTRACT

Beginning in 2006, predator suppression programs were implemented with the goal of reducing predatory fish abundance in Lake Pend Oreille (LPO). An angler incentive program (AIP) was introduced to incentivize sport harvest of Rainbow Trout *Oncorhynchus mykiss* (ended in 2013) and Lake Trout *Salvelinus namaycush* (ongoing). In addition, commercial trap net and gill net operations targeting Lake Trout were implemented to further reduce the predator population and subsequently increase kokanee *O. nerka* survival (ongoing). Much like Lake Trout in the early 2000s, an expanding Walleye *Sander vitreus* population has the potential to put several fish populations in LPO at risk through direct predation and competition, spurring the implementation of a Walleye netting feasibility project and periodic monitoring. This report provides preliminary results of the 2020 predator suppression programs on LPO. In 2020, 7,169 Lake Trout were caught in the suppression netting program, and another 777 in assessment netting for a total of 7,946. With the exception of 16 Lake Trout that were released or tagged for scientific purposes, all were removed from the lake. A total of 1,223 Bull Trout *S. confluentus* were also caught, with 308 being direct mortalities (25%). Anglers also turned in 2,641 Lake Trout heads through the AIP, for a total of 10,564 removed in 2020, with only 3 incidental Bull Trout mortalities due to angler misidentification. In addition, 576 Walleye were removed through the Walleye netting project, with only 15 incidental Bull Trout mortalities. Walleye were also included in the AIP in 2020 and resulted in 860 heads turned in during the year, with 10 reward tags ($1,000 each) being returned.

INTRODUCTION

Lake Pend Oreille (LPO) represents a stronghold for adfluvial Bull Trout *Salvelinus confluentus* within their native range. Rainbow Trout *Oncorhynchus mykiss* in LPO provide a popular world-class trophy fishery that largely depends on abundant kokanee *O. nerka* for forage. Kokanee also provide a popular yield fishery and are the main forage base for adfluvial Bull Trout.

Kokanee have been the primary driver of the LPO salmonid fishery since becoming established in the 1930s. They serve a dual role by providing both a high-yield sport fishery and the primary prey source for pelagic predators (e.g., Rainbow Trout, Bull Trout) that support trophy fisheries. From the 1950s through the mid-1970s, LPO anglers targeted mainly kokanee, with commensurately high kokanee harvests. The lake also supported an active commercial kokanee fishery. However, kokanee abundance began declining in the mid-1960s and reached a depressed state by the 1970s. The commercial fishery was closed in 1973. Lake Trout *S. namaycush* were introduced in the early part of the 20th century and became increasingly abundant by the early 2000s. Increased predation threatened to collapse the already diminished kokanee population (Hansen et al. 2010; Rust et al. 2020) which prompted the implementation of fishing regulation changes intended to balance high predator abundance, specifically Lake Trout and Rainbow Trout, with the declining kokanee prey base. In 2000, the kokanee fishery was closed, Rainbow Trout limits were liberalized, and the bag limit on Lake Trout was removed (Fredericks et al. 2003). Despite these efforts, the Lake Trout population continued to expand, and the kokanee fishery did not show signs of recovery. Restricted fish passage, zooplankton dynamics, and floods may have also contributed to the decline of kokanee (Corsi et al. 2019).

Research determined that reduced kokanee productivity in LPO, in concert with an over-abundance of upper trophic level predators, had created a predator pit that would have likely led to a complete collapse of kokanee in the system (Hansen et al. 2010). Beginning in 2006, with support from Avista and the Bonneville Power Administration (BPA), predator suppression programs were implemented with the goal of reducing predator abundance in LPO. An Angler Incentive Program (AIP) was introduced to incentivize sport harvest of Rainbow Trout and Lake Trout. In addition, commercial trap net and gill net operations targeting Lake Trout were implemented to further reduce the predator population and increase kokanee survival. The AIP was also intended to reduce Rainbow Trout abundance, but this component of the program was discontinued in 2013 because of limited success and increased resiliency of the kokanee population by that time. The predator suppression program has been a major success and the kokanee population has responded positively (Dux et al. 2019; Rust et al. 2020).

Walleye *Sander vitreus*, were illegally introduced into Noxon Reservoir in the early 1990s and have become well-established throughout Noxon and Cabinet Gorge reservoirs (Horn et al. 2009). These reservoirs provide suitable spawning and rearing habitat for Walleye and downstream drift was the likely source of subsequent invasions into the Idaho portion of the Clark Fork River, LPO, and the Pend Oreille River, where they now present a threat to these downstream fisheries. Walleye were originally documented in LPO in the early 2000s (Schoby et al. 2007), and the population remained stable at a low density until 2011. Since then, catch per unit effort in index netting surveys has approximately doubled every three years (Ryan et al.

2020). Additionally, increasing numbers of Walleye are being caught in Lake Trout netting efforts throughout the northern and southern basins of LPO (Rust et al. 2020).

Much like with Lake Trout, an expanding Walleye population has the potential to put several fish populations in LPO at risk through direct predation and competition. Walleye are prolific piscivores and their establishment in other western lentic systems has led to significant fishery management challenges, particularly where they overlap with salmonid fisheries (McMahon and Bennett 1998; MFWP 2016). Lake Trout existed at low abundances in LPO for many years before they became a predation concern, and it is likely a similar situation exists with Walleye. Lake Trout suppression programs were instituted to reduce predation risk when we began to observe rapid population increases, as we are now seeing with Walleye. These similar patterns led to the establishment of an experimental Walleye netting program in 2018 and a Walleye AIP in 2019. Unlike the bounty system established for Lake Trout, the Walleye AIP instead focuses on a small number of tagged fish for a high reward ($1,000 per fish). Should Walleye abundance continue to increase and the scope of their niche expand to include ecologically significant predation on kokanee, Westslope Cutthroat Trout *O. clarkii lewisi*, and juvenile Bull Trout and Rainbow Trout, some of the conservation successes and recreational fishery enhancements made through previous suppression programs may be at risk.

This report provides a timely summary of preliminary results from the 2020 predator suppression programs on LPO.

METHODS

LAKE TROUT

Netting

Lake Trout netting methods closely followed those described in Rust et al. (2020). Hickey Brothers Research, LLC was contracted to remove Lake Trout from LPO using gill nets during 13 weeks in the winter/spring netting season (January 10–April 10) and 11 weeks in the fall netting season (September 7–November 19).

Five weeks of standardized assessment netting was also conducted between November 30 and December 18. In prior years, trap net catch rates were utilized as an index of Lake Trout and Bull Trout abundance. Trap netting was discontinued in 2018 and replaced with the random assessment netting protocol based upon an analysis by Hansen et al. (2019). Data from this program will be utilized to conduct a cohort analysis for Lake Trout, which will provide an annual age-specific abundance estimate.

Bottom-set gill nets with stretch mesh sizes ranging from 3.8 to 14 cm were used. Each net was 274 m long and several were tied together to form a gang that was generally set in a serpentine pattern parallel to shore. Gill nets were set around dawn and retrieved in the late-morning (typically 4–6 hour sets). See Rust et al. (2020) for a more detailed explanation of netting methods and a summary of the 2017–2018 results.

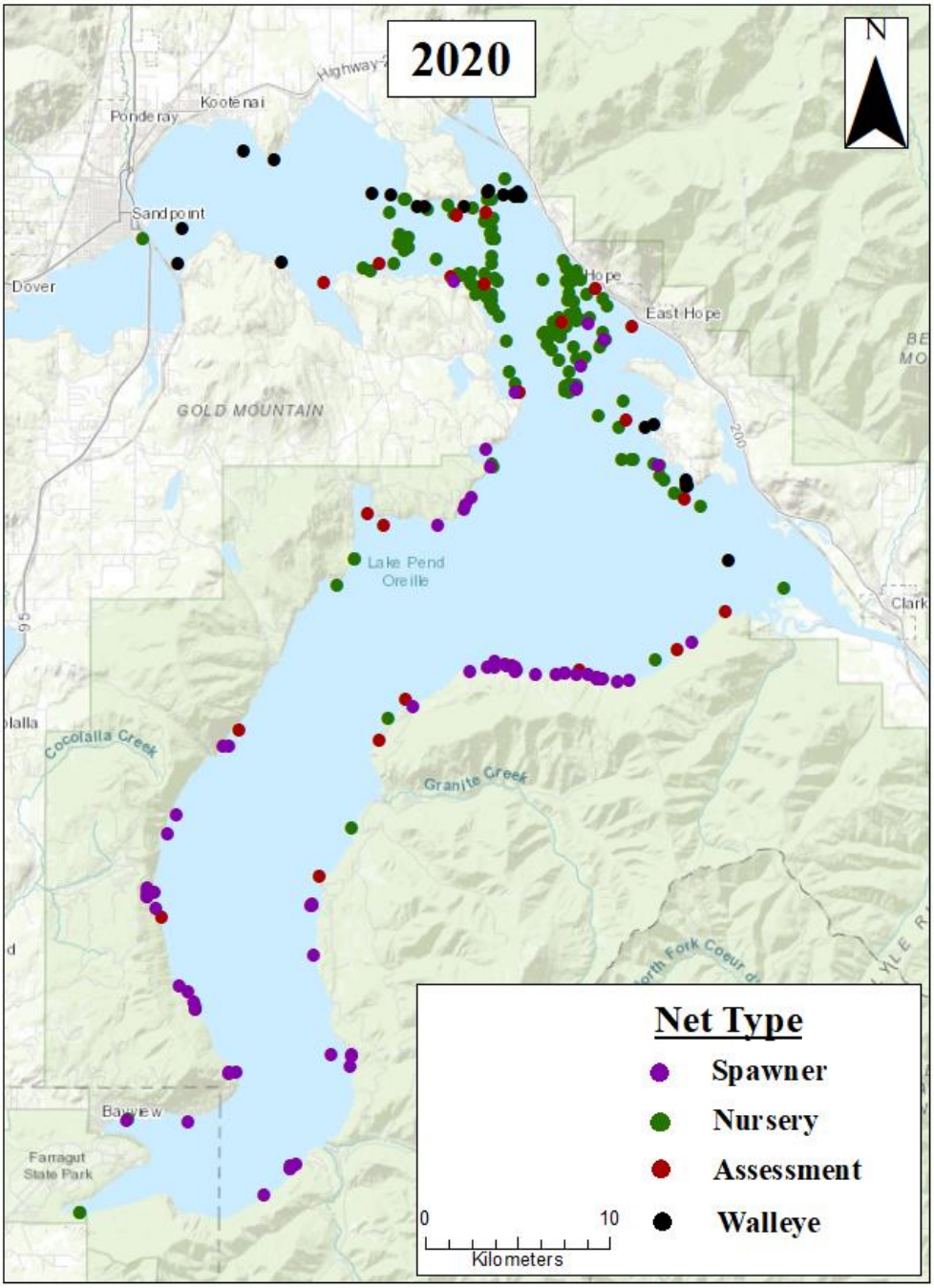

Figure 1. Net locations for Lake Trout (random assessment, nursery, and spawner) and Walleye experimental netting in Lake Pend Oreille, Idaho, 2020.

With the exception of Lake Whitefish *Coregonus clupeaformis*, all game fish captured in gill nets were enumerated. Because of high catch rates, Lake Whitefish were enumerated from a stratified random subset of standardized assessment netting locations. Catch rates were calculated as the number of fish of a particular species captured per 274 m net (box).

All captured individuals of target species (e.g., Lake Trout, Northern Pike *Esox lucius*, and Walleye) were measured for total length and, with few exceptions (i.e., those tagged for research purposes), removed from the population and donated to local food banks or raptor rehabilitation facilities. Sex and maturity were determined for most of the Lake Trout captured throughout the spawning period (September–November). Otoliths were removed from a subset of Lake Trout during the fall (late September-December) for ageing purposes. All Bull Trout were measured for total length and scanned for PIT tags. Previously unmarked Bull Trout were implanted with a 12-mm half duplex PIT tag, revived in an oxygenated tank if necessary, assigned a condition score, and released. In addition, when incidental mortalities occurred, total length, head length, and body depth were measured; sex and maturity level were determined; genetic samples, otoliths, scales, and fin rays were collected; pathogen samples were taken; and stomach contents were described.

Lake Trout Angler Incentive Program

Anglers that caught Lake Trout from LPO had the option to turn the heads in to freezers placed around the lake at angler access points for a payment of $15 per head. Heads were collected from freezers weekly, identified to species, and measured from the tip of the snout to the posterior edge of the operculum. Previously developed head-length to total-length relationships for Lake Trout in LPO (Wahl et al. 2013) were used to extrapolate total length. In addition to the freezer collections, angler clubs had the ability to apply for AIP sponsorship at fishing derbies. Funds were used to increase the total dollar amount of prize winnings for each derby, typically increasing the participation and resulting number of Lake Trout removed from the system.

WALLEYE

Telemetry

During spring 2019 through spring 2020, Walleye greater than 495 mm (n = 33) in LPO were tagged using Vemco acoustic telemetry tags for tracking purposes. Tags were implanted into fish via a 4.5 cm incision in the anterior of the abdomen and closed with non-absorbable sutures. An acoustic telemetry array was installed in 2019 and was able to passively track fish movements within the system throughout the year. To supplement this array, fish were also tracked using active methods from a research boat.

Netting

Hickey Brothers Research, LLC was contracted to operate gill nets during three weeks in the spring of 2020 (April 13–May 1) to target Walleye. This was done to evaluate their use as a tool to reduce Walleye abundance in LPO. Aided by telemetry data, gill net effort was primarily focused on the following areas: Pack River delta, Fisherman's Island area, Sheepherder point, immediately north of the Burlington Northern train bridge in Sandpoint, Kootenai Point, and adjacent to the mouth of the Clark Fork River delta.

Bottom-set gill nets with stretch mesh sizes of 8.9, 10.6, and 11.4 cm were used. Each net was 274 m long. Several nets were tied together to form a gang. Gang-specific mesh size and set locations may have varied based upon recent catch data to maximize catch rates of target species while minimizing bycatch. Gill nets were set just before dawn and retrieved mid-morning, typically after 4–5 hours fishing time. With the exception of Lake Whitefish (because of high abundances in the catch), all fish captured in gill nets were enumerated. Catch rates were calculated as the number of Walleye captured per 274 m net.

All captured Walleye were weighed, measured for total length, and checked for existing tags or marks. Eighteen Walleye were implanted in the snout with coded wire tags during spring 2019 and 40 were implanted with coded wire tags in spring 2020. All were released as replacements for mortalities that occurred during netting in order to maintain an adequate group of tagged fish for the angler incentive program. To date, 109 Walleye have been implanted with coded wire tags. Remaining Walleye captured during netting were taken to local food banks. All Bull Trout were measured for total length and scanned for PIT tags. Live Bull Trout were implanted with a 12-mm half duplex PIT tag if they were not already tagged, revived in an oxygenated tank if necessary, assigned a condition score, and released. Head length and body depth were measured, sex and maturity level determined, genetic samples, otoliths, scales, and fin rays were collected, pathogen samples taken, and stomach contents were described from all Bull Trout mortalities.

Walleye Angler Incentive Program

Anglers that caught Walleye from LPO had the option to turn the heads in to freezers already in place for the Lake Trout AIP. Heads were collected from freezers weekly and measured from the tip of the snout to the posterior edge of the operculum. Previously developed head-length to total-length relationships for Walleye in Lake Pend Oreille were used to extrapolate total length. Anglers received one entry for each head submitted in a monthly drawing for 10 rewards ($100 each). Walleye heads were also scanned for a coded wire tag and, when present, the angler received a $1,000 reward.

Fall Walleye Index Netting (FWIN)

FWIN surveys have been conducted every three years in LPO since 2011 to evaluate the relative abundance and distribution of Walleye in LPO and the Pend Oreille River. Walleye were again sampled in 2020 following protocols described in Morgan (2002) and Ryan et al. (2020).

RESULTS AND DISCUSSION

LAKE TROUT

Netting

A total of 7,946 Lake Trout were captured during 2020; 7,169 from suppression netting and another 777 from the assessment netting. With the exception of 16 released or tagged for scientific purposes, all were removed from the lake. A total of 1,223 Bull Trout were also caught during suppression (n = 1,011) and assessment (n = 212) netting, with 308 of them being mortalities (25%). The number of Lake Trout removed by the netting program annually since 2006 is shown in Figure 2.

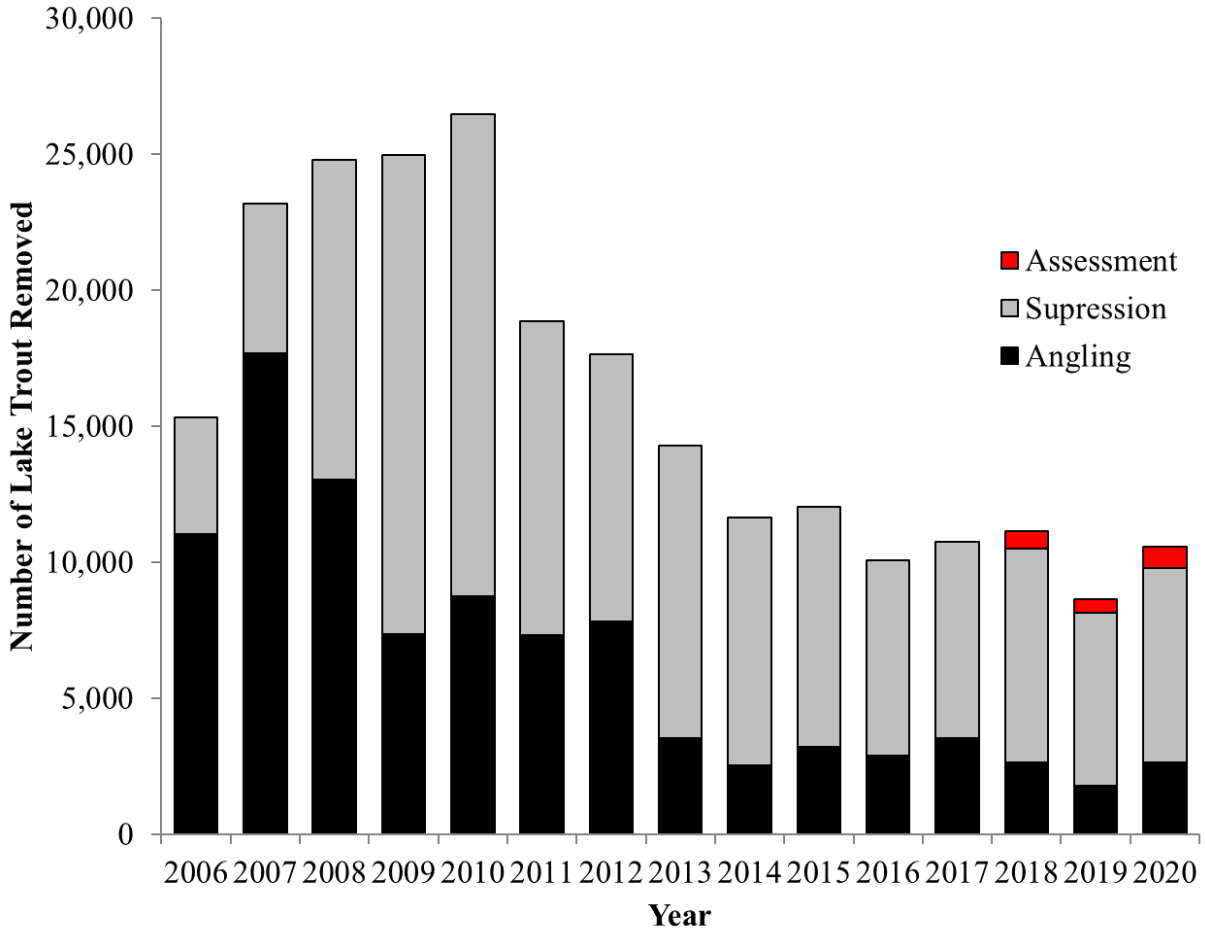

Figure 2. Number of Lake Trout removed during suppression netting, assessment netting, and by incentivized angling from 2006–2020, Lake Pend Oreille, Idaho.

Data specific to the spring 2020 netting program are listed in Appendix A, fall 2020 netting program data are listed in Appendix B, and the random assessment netting data are listed in Appendix C.

Angler Incentive Program

Anglers turned in a total of 2,641 Lake Trout heads in 2020 (Figure 2). A total of 206 different anglers participated in the program in 2020. Four LPO derbies were recipients of sponsorship funding. These were the Lake Pend Oreille Idaho Club Ross Milliken Members Only (September 19–20) and Thanksgiving derbies (November 21–29); the Lake Pend Oreille Anglers Club Fall (November 4–8) derby; and the Captn's Table Halloween (October 24–25) derby. The entire $2,000 for each derby was dedicated towards Lake Trout prizes. Data were collected from all submitted heads to describe the size structure of the fish harvested under this program.

In 2020, three Bull Trout were misidentified and submitted for payment as putative Lake Trout. Genetic samples were taken from all of these fish for species confirmation. The high compliance

by anglers participating in the AIP is indicative of the effectiveness of the ongoing species identification education efforts (Masin et al. 2020).

Data specific to the 2020 Lake Trout AIP are listed in Appendix D.

WALLEYE

Telemetry

From telemetry efforts, it was determined that Walleye were concentrated at two main areas during the spring: the Clark Fork River and delta, and from the Pack River mouth west to the eastern edge of Oden Bay. Walleye were more widely distributed during the summer period with loose concentrations of fish located in the Clark Fork River and delta, in shallow warmer bays including Denton Slough, Oden Bay and Kootenai Bay, and downstream to near the Sandpoint Bridges and into the Pend Oreille River.

Netting

Gillnetting proved to be an effective method for capturing Walleye during the pre-spawn period. Walleye were concentrated in relatively shallow water and catch rates were relatively high while by-catch was reasonably low. A total of 576 Walleye were removed (Figure 3), with only 15 incidental Bull Trout mortalities.

Data specific to the 2020 Walleye Netting Program are listed in Appendix E.

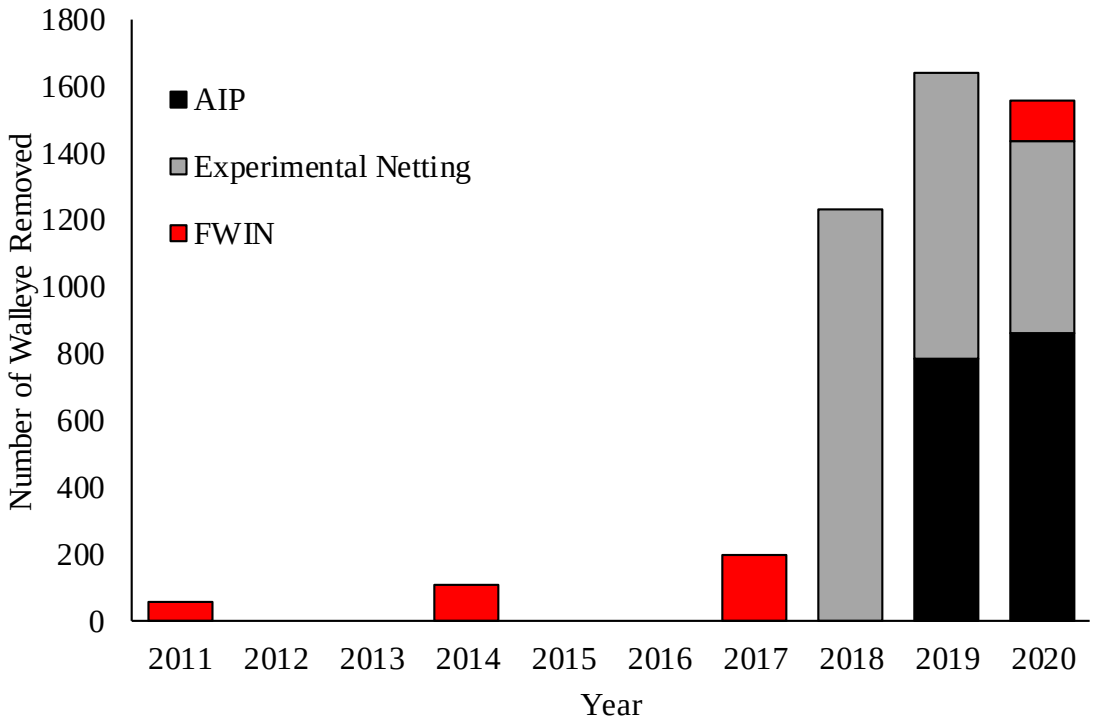

Figure 3. Number of Walleye removed during experimental suppression netting, FWIN surveys and by incentivized angling from 2011–2020.

Angler Incentive Program
Anglers submitted 860 Walleye heads in 2020 (Figure 3). Ten of the heads contained a coded wire tag. A total of 183 unique anglers participated in this program in 2020.

Data specific to the 2020 Walleye AIP are listed in Appendix F.

Fall Walleye Index Netting (FWIN)
The FWIN survey was conducted from October 4 through October 9, 2020. Forty-eight gill net-nights were fished among all sampled areas. A total of 119 Walleye were collected (Figure 3). Walleye CPUE ranged from 0 to 11 Walleye per net and fish were captured at 35 of the 48 sampled sites. Mean CPUE for Walleye was 2.5 fish/net (SD = 2.8). Walleye catch was distributed across all areas where netting occurred. Catch rates in 2020 were less than those recorded in 2017 and more closely resembled those measured in 2014 (Figure 4). Results from previous surveys are listed in Ryan et al. (2020). Preliminary 2020 FWIN data are listed in Appendix G.

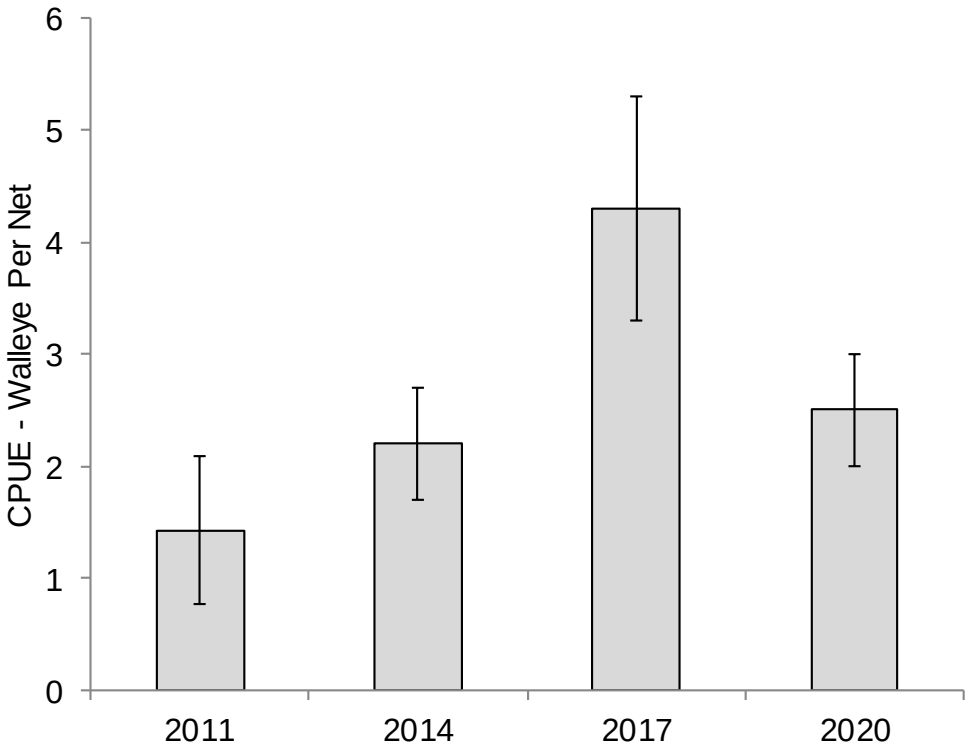

Figure 4. Walleye CPUE data from the 2011–2020 FWIN surveys.

RECOMMENDATIONS

- Continue Lake Trout suppression netting at the existing effort level
- Continue to implement the fall random assessment Lake Trout netting program
- Continue the Lake Trout AIP, including angler payouts and derby sponsorships
- Continue investigating the use of netting to suppress the Walleye population
- Continue the Walleye AIP and use of coded wire high-reward tags
- Continue conducting FWIN surveys every three years

ACKNOWLEDGEMENTS

The authors wish to thank Bill Harryman, Hunter Styka, Josh Pluid, Kramer Fiscus, Sawyer Livesey, Ben Birdsall, Austin Piette, Will Bass, Chuck Lowman, Dave Leptich, Doug Meyer, Dustin Masin, Evan Dehamer, Merritt Horsmon, Micah Ellstrom, Norm Merz, Tyler Schober, Jacob Berl, Matt Corsi, Matt Haag, James Whalen, and Harris Wester (IDFG); Sarah Busmire, Jake Johnson, and Kevin Duffy (Avista), and all the Hickey Brothers Research (LLC) crew for assistance with field work. Thanks to Paul Kusnierz and Sean Moran (Avista), Travis Rehm (MFWP), Kevin Aceituno (USFS), Andy Dux and Chip Corsi (IDFG) for their review of previous versions of this report. We would also like to thank Avista employees Nate Hall, Heide Evans, Ceil Orr, and Paul Kusnierz for their oversight and administrative support. These projects were funded through Appendix F5 of the Clark Fork Settlement Agreement and the U.S. Department of Energy, Bonneville Power Administration.

LITERATURE CITED

Corsi, M. P., M. J. Hansen, M. C. Quist, D. J. Schill, and A.M. Dux. 2019. Influences of Lake Trout (*Salvelinus namaycush*) and *Mysis diluviana* on kokanee (*Oncorhynchus nerka*) in Lake Pend Oreille, Idaho. Hydrobiologia 840:351–362.

Dux, A. M., M. J. Hansen, M. P. Corsi, N. C. Wahl, J. P. Fredericks, C.E. Corsi, D. J. Schill, and N. J. Horner. 2019. Effectiveness of Lake Trout (*Salvelinus namaycush*) suppression in Lake Pend Oreille, Idaho: 2006–2016. Hydrobiologi 840:319-333.

Fredericks, J., J. Davis, and N. Horner. 2003. Regional fisheries management investigations, Panhandle Region. Job Completion Report 02-53. Idaho Department of Fish and Game, Boise ID.

Hansen, M. J., D. Schill, J. Fredericks, and A. Dux. 2010. Salmonid predator-prey dynamics in Lake Pend Oreille, Idaho, USA. Hydrobiologia 650:85–100.

Hansen, M. J., M. P. Corsi, and A. M. Dux. 2019. Long-term suppression of the Lake Trout (*Salvelinus namaycush*) population in Lake Pend Oreille, Idaho. Hydrobiologia 840:335–349.

Horn, C., J. Hanson, T. Tholl, and K. Duffy. 2009. Noxon Reservoir Walleye Life History. Prepared for: Avista Corporation, Noxon MT.

Masin, D., K. Bouwens, D. Tabish, M. Terrazas, T. Hinck, M. Post, R. Crawford, and S. Moran. 2020. Bull Trout Protection and Public Education Project (Appendix D). 2020 Annual Work Summary. Prepared for: Avista Corporation, Noxon, Montana.

McMahon, T. E. and D. H. Bennett. 1996. Walleye and northern pike: boost or bane to northwest fisheries?. Fisheries 21:6–13.

Morgan, G.E. 2002. Manual of Instructions – Fall Walleye Index Netting (FWIN). Laurentian University. Sudbury, Ontario Canada.

MFWP (Montana Fish, Wildlife and Parks). 2016. Ecology and Management of Montana Walleye Fisheries. Avista document identification number 2016-0449. Montana Cooperative Fishery Research Unit, Montana State University, Bozeman, Montana, and Montana Fish, Wildlife and Parks, Helena, Montana.

Rust, P., N. Mucciarone, S. M. Wilson, M. P. Corsi, and W. H. Harryman. 2020. Lake Pend Oreille Research, 2017 and 2018. Lake Pend Oreille Fishery Recovery Project Annual Progress Report, January 1, 2017–December 31, 2018. IDFG Report Number 20-01. Boise, ID.

Ryan, R., C. Watkins, A. Dux, T. J. Ross, J. Fennell, and R. Gary. 2020. Fishery Management Annual Report, Panhandle Region 2017. IDFG Report Number 20-107, Boise, ID.

Schoby, G. P., T. Bassista, and M. Maioline. 2007. Effects of Higher Winter Water Levels on the Pend Oreille River Fish Community. Lake Pend Oreille Recovery Project 2005 Annual Progress Report, Part 2. IDFG Report 07-15.

Wahl, N. C, A. M. Dux, W. J. Ament, and W. Harryman. 2013. Lake Pend Oreille Research, 2011. Annual Report to Bonneville Power Administration, Contract Number 52380. Report number 13-22, Portland, OR.

APPENDICES

APPENDIX A: WINTER/SPRING 2020 LPO LAKE TROUT NETTING SUMMARY

1/12/2020–4/10/2020
Jeff Strait
01/28/2021

Overview

During spring 2020, gill netting effort was divided into two categories based on the primary target and the mesh sizes fished. We fished 2.5 and 2.0 inch (63.5mm and 50.8mm) mesh gill nets to target juvenile Lake Trout (*Salvelinus namaycush*) in the nurseries (hereafter, Nursery) and 5.5 and 5.0 inch (139.7mm and 127mm) mesh gill nets to target adult Lake Trout (hereafter, Adult LKT). In the nursery netting sets a total of 2,774 Lake Trout were removed ranging from 200mm to 825mm total length using an effort of 645,300 ft (19,6687.44 m) of net. In the adult netting sets a total of 476 Lake Trout were removed ranging from 330 mm to 1,030 mm total length using an effort of 379,800 ft (11,5763.04 m) of net. A grand total of 3,250 Lake Trout were removed during the spring 2020 netting season.

As part of the bycatch during these efforts, 11 different species were captured including ESA Threatened Bull Trout (*S. confluentus*). A total of 233 Bull Trout were captured during the Lake Trout suppression efforts with an average direct mortality rate of 15.02%. We PIT tagged 117 and recaptured 89 previously tagged Bull Trout. Bull Trout condition was broken down as following:

- Good = 145
- Fair = 20
- Poor = 5
- Not Reported = 28
- Mortalities = 35 (mort recaps = 8)

The following tables and figures provide summary information on catch and bycatch from gill net efforts during the complete spring 2020 netting season.

Tables

Table 1: Summary of the spring 2020 gillnetting for Adult Lake Trout (LKT) and Nursery netting sets. For each species, statistics include the number captured (Captured), released alive (Released), tagged with PIT tags (Tagged), recaptured PIT-tagged (Recaptured), and removed from LPO (Removed). For species other than Lake Trout, Walleye, or Northern Pike, the number of individuals removed represents fish that were "dead on capture".

Project	Species	Captured	Released	Tagged	Recaptured	Removed
Adult LKT	Lake Trout	476	1	0	1	475
	Bull Trout	114	103	61	53	11
	Walleye	16	8	0	0	8
	Northern Pike	11	0	0	0	11
	Brown Trout	5	5	0	0	0
	Rainbow Trout	5	5	0	0	0
	Tench	3	3	0	0	0
	Smallmouth Bass	1	1	0	0	0
Nursery	Lake Trout	2,774	1	0	0	2,773
	Bull Trout	119	95	83	36	24
	kokanee	16	13	0	0	3
	Northern Pike	15	0	0	0	15
	Westslope Cutthroat Trout	15	13	0	0	2
	Yellow Perch	11	9	0	0	2
	Brown Trout	2	1	0	0	1
	Rainbow Trout	2	2	0	0	0
	Walleye	2	2	0	0	0
	Smallmouth Bass	1	1	0	0	0

Table 2: Totals of the spring 2020 gillnetting statistics for both Adult LKT and Nursery netting. For each species, statistics include the number captured (Captured), released alive (Released), tagged with PIT tags (Tagged), recaptured PIT-tagged (Recaptured), and removed from LPO (Removed). For species other than Lake Trout, Walleye, or Northern Pike, the number of individuals removed represents fish that were "dead on capture".

Species	Captured	Released	Tagged	Recaptured	Removed
Lake Trout	3250	2	0	1	3248
Bull Trout	233	198	144	89	35
Northern Pike	26	0	0	0	26
Walleye	18	10	0	0	8
kokanee	16	13	0	0	3
Westslope Cutthroat Trout	15	13	0	0	2
Yellow Perch	11	9	0	0	2
Brown Trout	7	6	0	0	1
Rainbow Trout	7	7	0	0	0
Tench	3	3	0	0	0
Smallmouth Bass	2	2	0	0	0

Table 3: Summary of length data for Lake Trout, Bull Trout, and Bull Trout (BLT) mortalities captured in gillnets during the spring 2020.

Project	Species	Mean TL	SE	Max TL	Min TL
Adult LKT	BLT	603.7	7.9	1000	330
	BLT Mortalities	660.9	18.7	770	580
	LKT	623.4	4.8	1030	330
Nursery	BLT	486.1	11.7	725	200
	BLT Mortalities	440.2	22.5	690	280
	LKT	317.7	1.1	825	200

Table 4: Catch data for Lake Trout, Bull Trout, and Bull Trout mortalities from Adult, Nursery, and all gillnets combined (S20 All Nets) during the spring 2020. These statistics include the total number of Lake Trout (LKT), live Bull Trout (BLT), Bull Trout mortalities (BLT Morts), the mean catch ratios of Lake Trout to live Bull Trout (LKT:BLT), Lake Trout to Bull Trout mortalities (LKT:BLT Morts), and the mean proportion of Bull Trout captures that resulted in direct mortality (Prop Morts).

	LKT	BLT	BLT Morts	LKT:BLT	LKT:BLT Morts	Prop Morts
Adult LKT	476	103	11	4.62	43.27	0.11
Nursery	2774	95	24	29.20	115.58	0.25
S20 All Nets	3250	198	35	16.41	92.86	0.18

Table 5: Catch per unit effort statistics for Lake Trout, Bull Trout, and Bull Trout mortalities from Adult, Nursery, and all gillnets combined (S20 All Nets) during the spring 2020. These statistics include the total number of 274m gillnet panels fished (Effort), and the Mean and SE of daily catch per unit effort (# fish / 274m of net) for Lake Trout (LKT CPUE, LKT SE), Bull Trout (BLT CPUE, BLT SE), and Bull Trout mortalities (BLT Mort CPUE, BLT Mort SE).

	Effort	LKT CPUE	LKT SE	BLT CPUE	BLT SE	BLT Mort CPUE	BLT Mort SE
Adult LKT	437	1.10	0.10	0.24	0.04	0.03	0.01
Nursery	717	4.07	0.35	0.15	0.02	0.03	0.01
S20 All Nets	1154	2.79	0.23	0.19	0.02	0.03	0.01

Table 6: Catch data for Lake Trout, Bull Trout, and Bull Trout mortalities for each gillnet mesh size (inches) fished during the spring 2020. These statistics include the total number of Lake Trout (LKT), live Bull Trout (BLT), Bull Trout mortalities (BLT Morts), the mean catch ratios of Lake Trout to live Bull Trout (LKT:BLT), Lake Trout to Bull Trout mortalities (LKT:BLT Morts), and the mean proportion of Bull Trout captures that resulted in direct mortality (Prop Morts).

Mesh Size (in)	LKT	BLT	BLT Morts	LKT:BLT	LKT:BLT Morts	Prop Morts
5.5	256	52	2	4.92	128.00	0.04
5.0	220	51	9	4.31	24.44	0.18
2.5	1047	53	13	19.75	80.54	0.25
2.0	1727	42	11	41.12	157.00	0.26

Table 7: Catch per unit effort statistics for Lake Trout, Bull Trout, and Bull Trout mortalities for each gillnet mesh size (inches) fished during the spring 2020. These statistics include the total number of 274m gillnet panels fished (Effort), and the Mean and SE of daily catch per unit effort (# fish / 274m of net) for Lake Trout (LKT CPUE, LKT SE), Bull Trout (BLT CPUE, BLT SE), and Bull Trout mortalities (BLT Mort CPUE, BLT Mort SE).

Mesh Size (in)	Effort	LKT CPUE	LKT SE	BLT CPUE	BLT SE	BLT Mort CPUE	BLT Mort SE
5.5	246	1.04	0.15	0.21	0.06	0.01	0.01
5.0	191	1.16	0.15	0.28	0.07	0.05	0.02
2.5	360	3.07	0.33	0.17	0.03	0.04	0.01
2.0	357	5.08	0.59	0.14	0.03	0.03	0.02

Figures

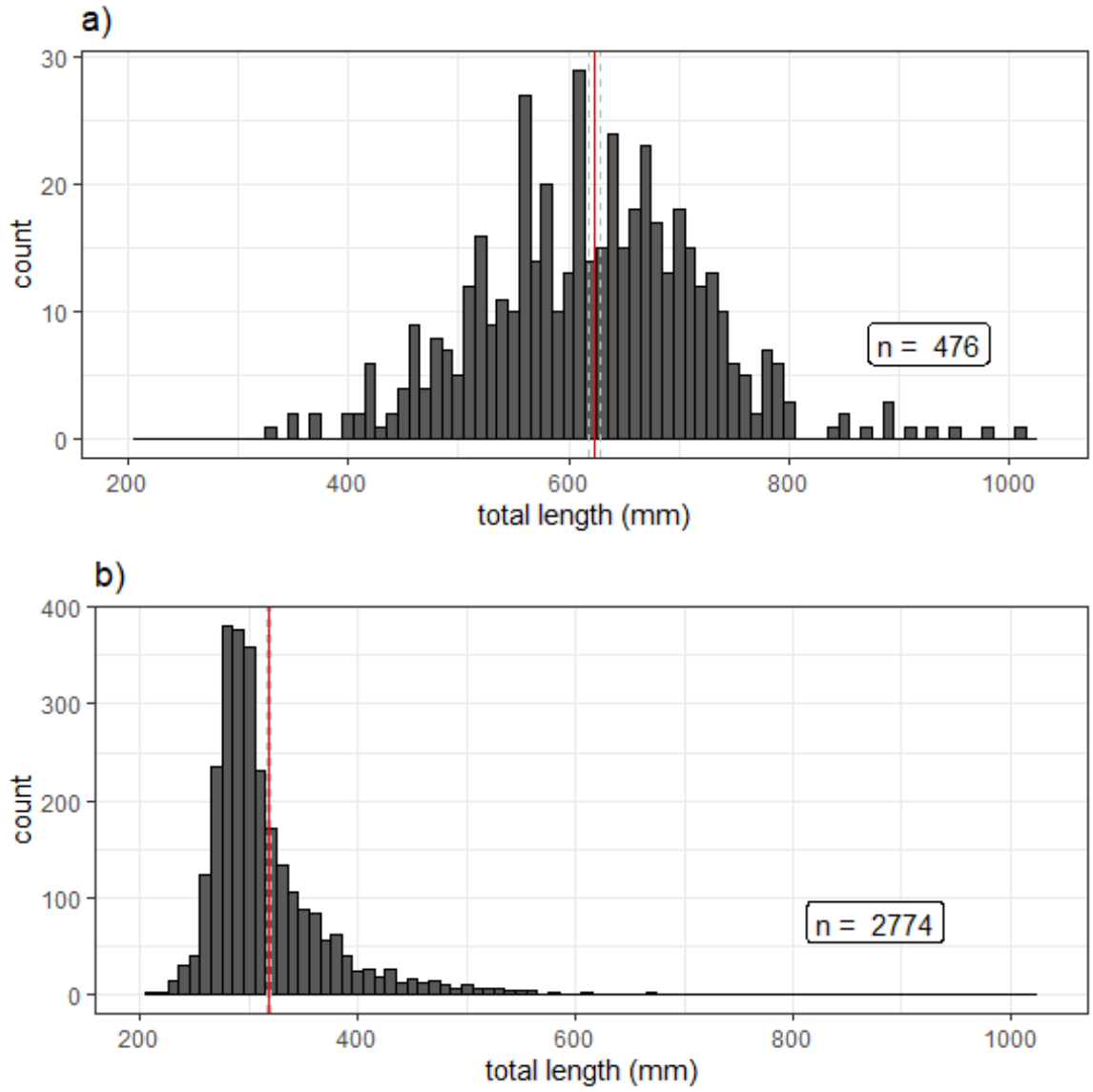

Figure 1: Length frequencies of Lake Trout captured in gillnets during spring 2020 Adult (a) and Nursery (b) netting efforts. Vertical red lines represent the sample mean length for each group and the dashed grey lines represent one standard error above and below the sample mean.

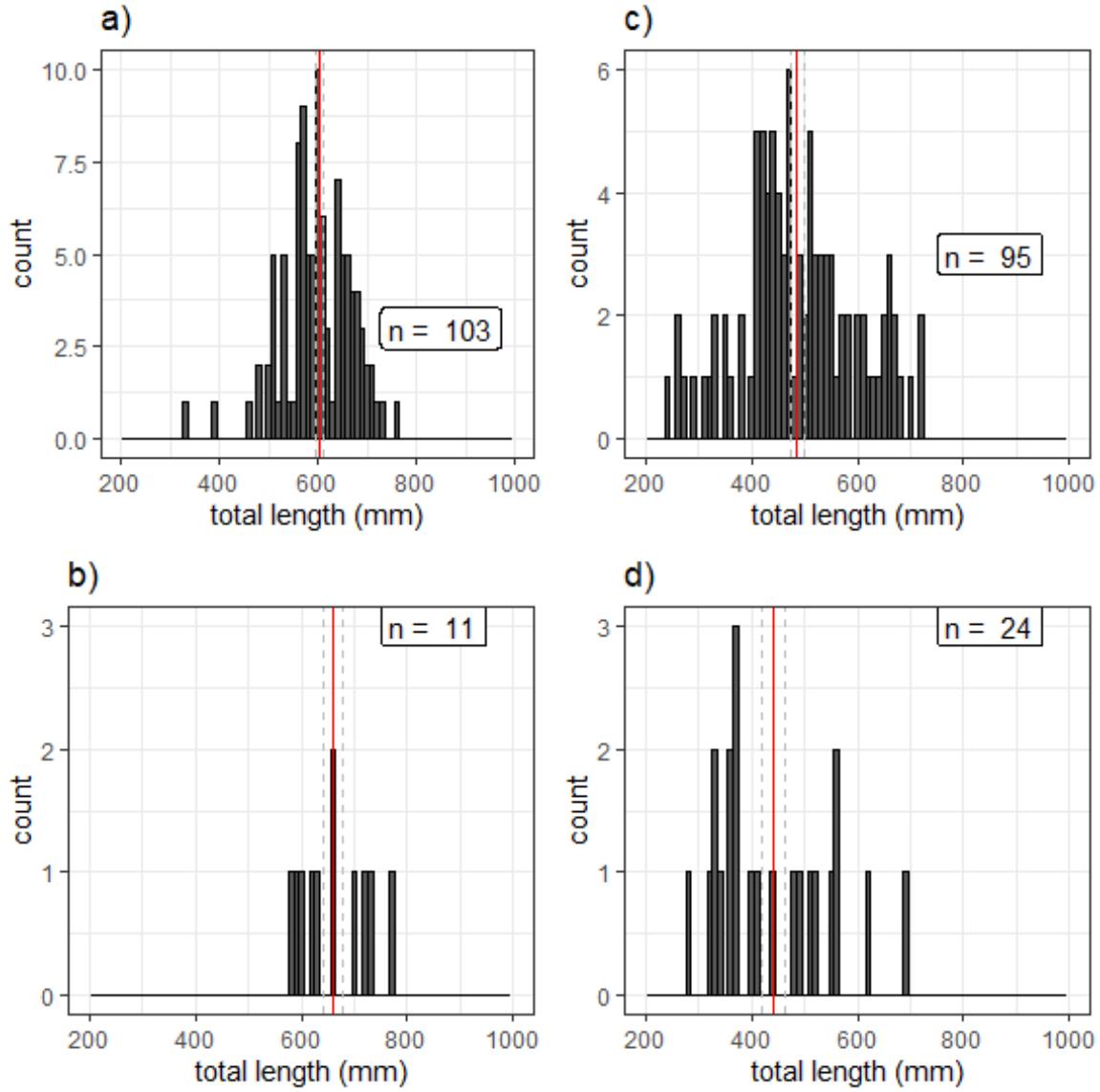

Figure 2: Length frequencies of Bull Trout captured in gillnets during spring 2020 netting efforts. Panels a) and b) are the length frequencies of Bull Trout released alive in the Adult and Nursery netting efforts, respectively. Panels c) and d) are the length frequencies of Bull Trout mortalities in the Adult and Nursery netting efforts, respectively. Vertical red lines represent the sample mean length for each group and the dashed grey lines represent one standard error above and below the sample mean.

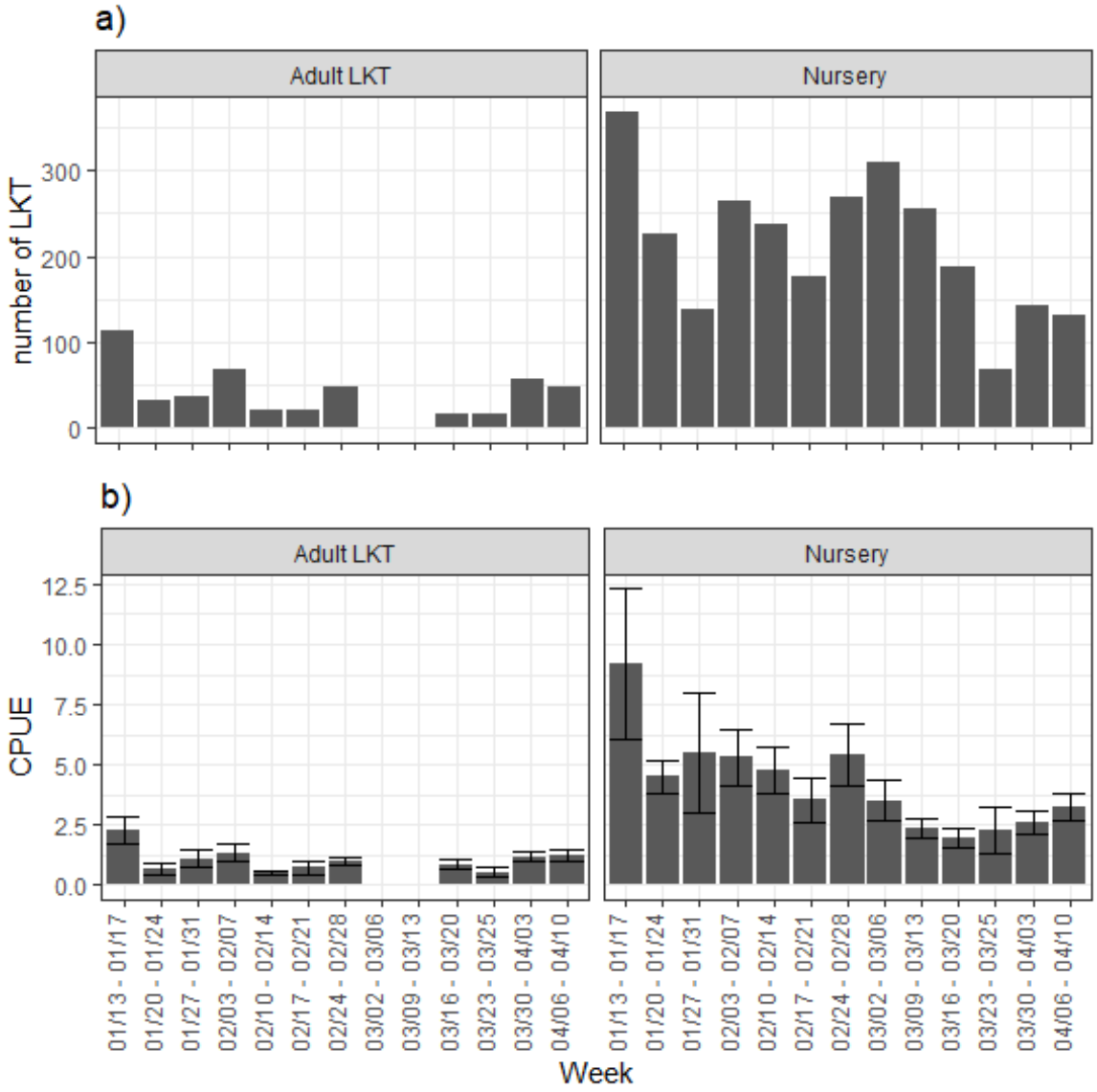

Figure 3: Weekly catch (a) and mean weekly CPUE (b, with SE bars) of Lake Trout captured during the spring 2020 gillnetting efforts.

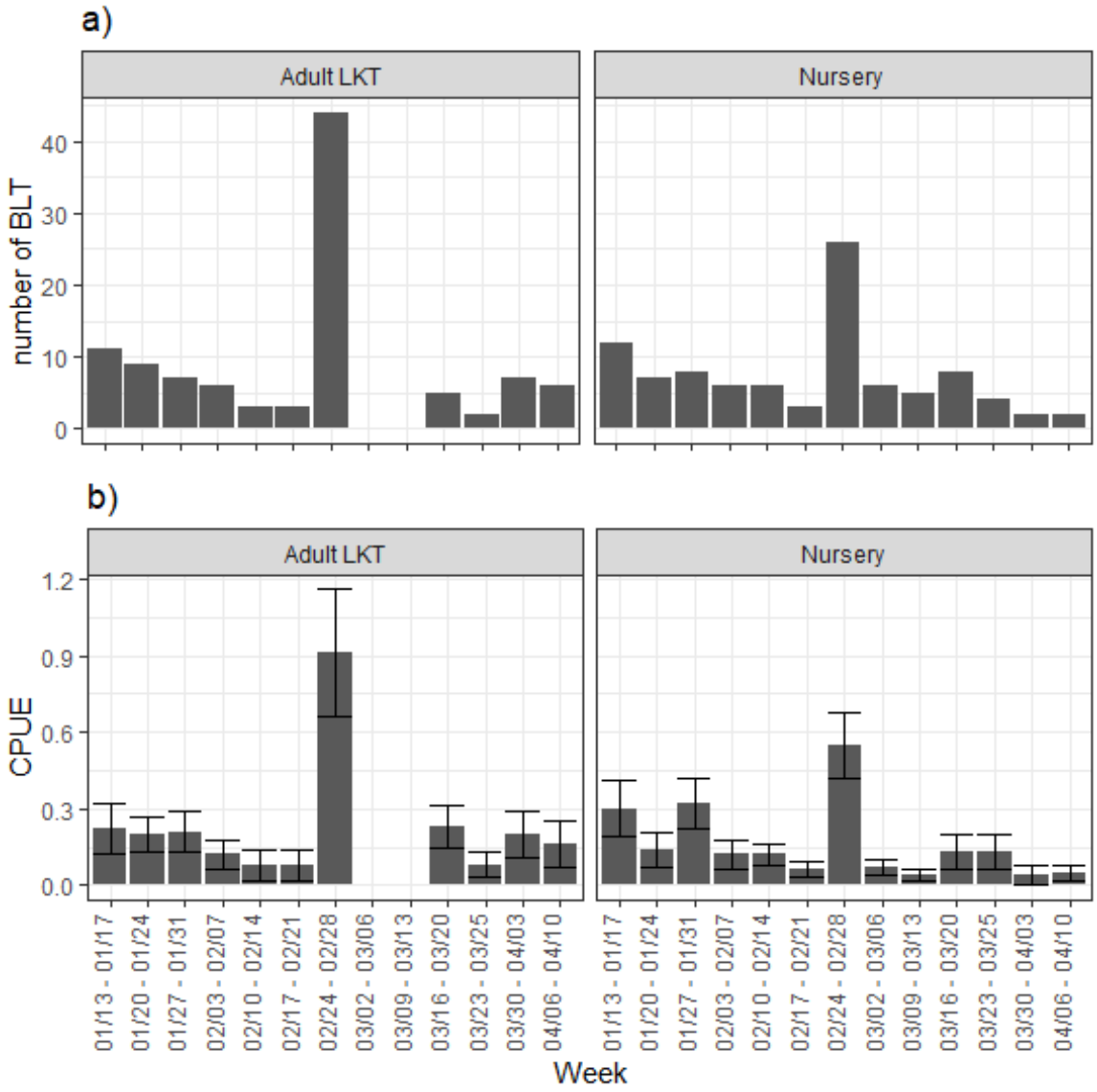

Figure 4: Weekly catch (a) and mean weekly CPUE (b, with SE bars) of Bull Trout captured and released alive during the spring 2020 gillnetting efforts.

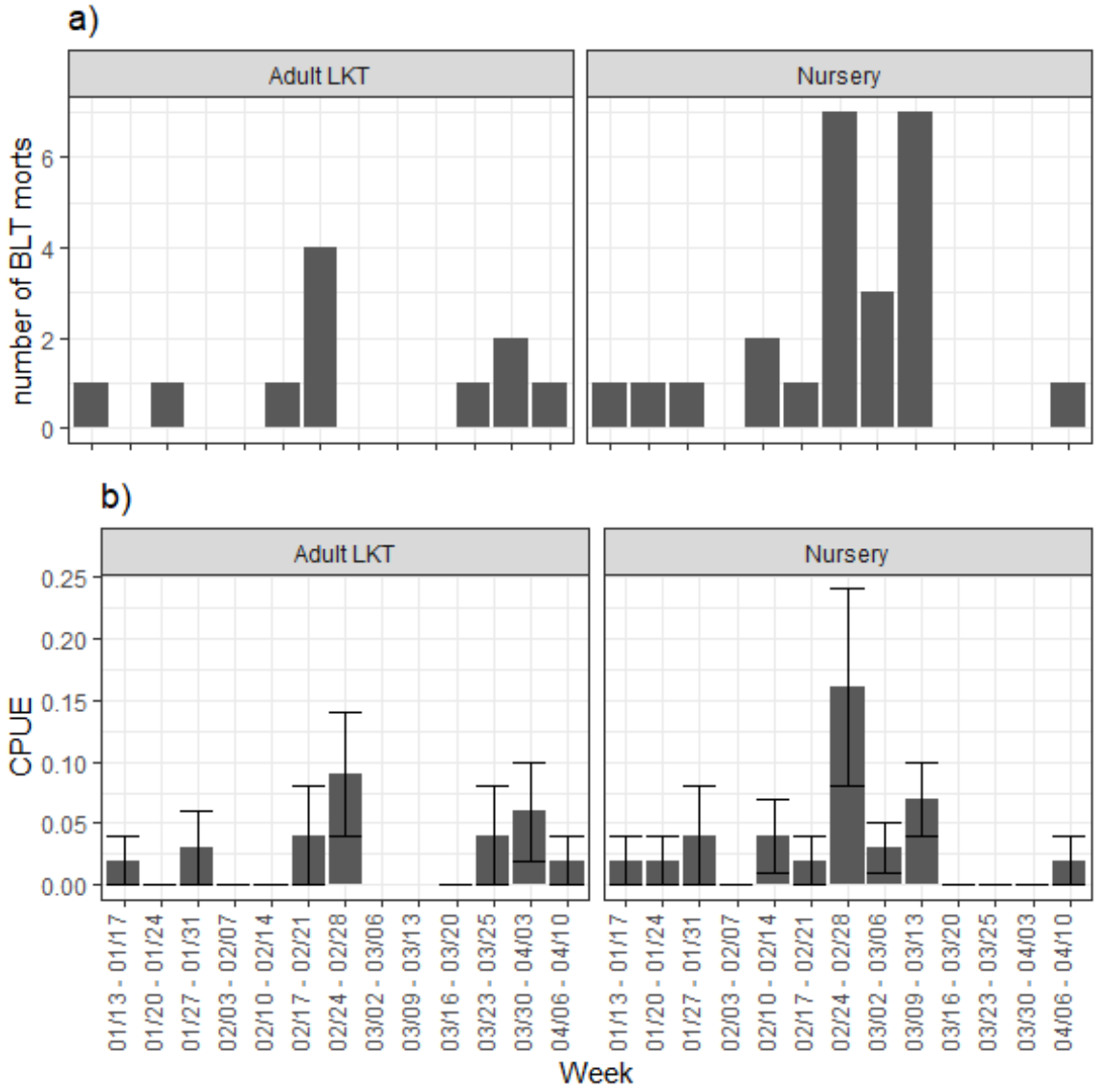

Figure 5: Weekly catch (a) and mean weekly CPUE (b, with SE bars) of Bull Trout mortalities during the spring 2020 gillnetting efforts.

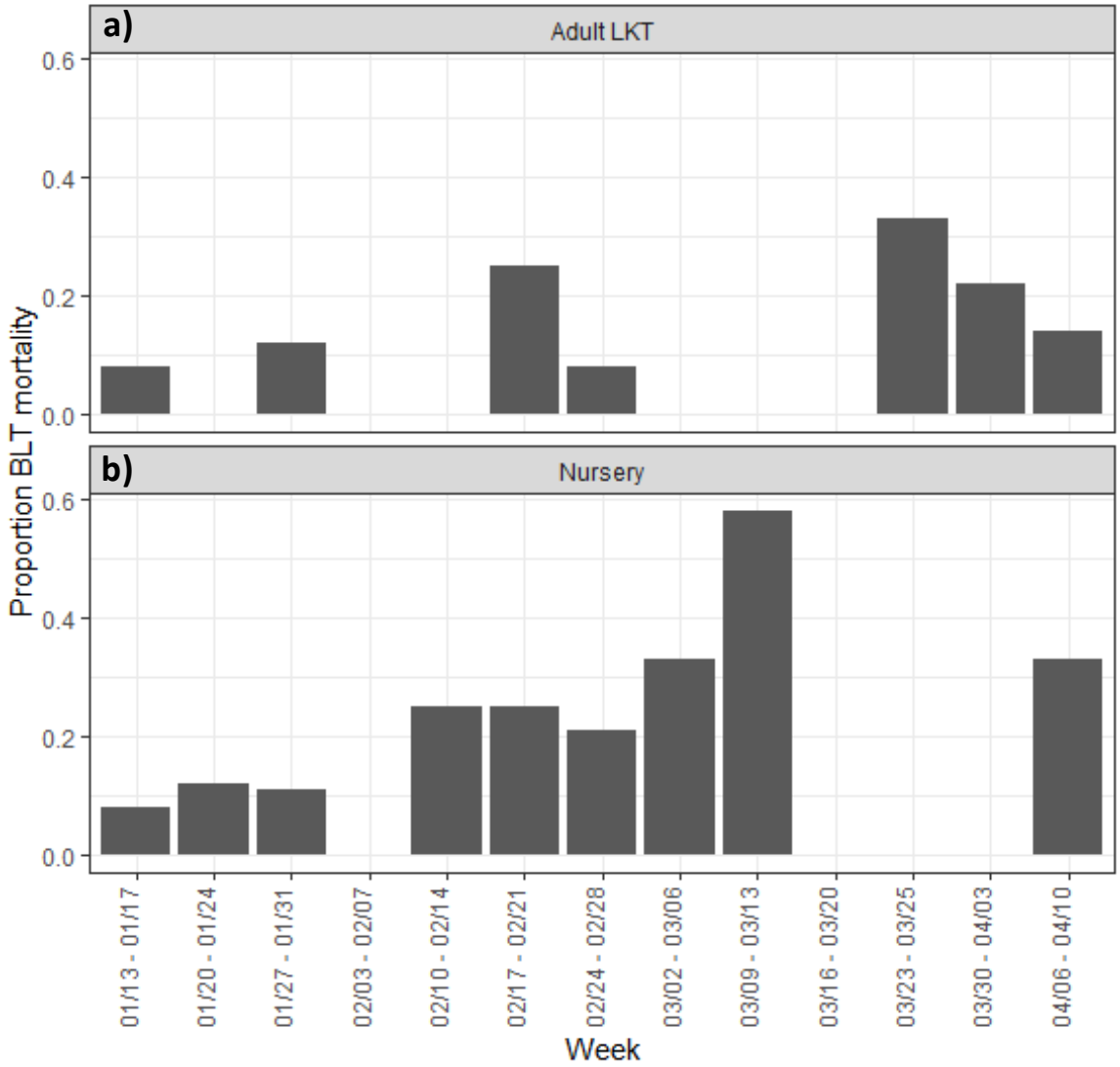

Figure 6: Proportion bycatch resulting in mortality for Bull Trout captured in Adult (a) and Nursery b) netting during the spring 2020 gillnetting efforts.

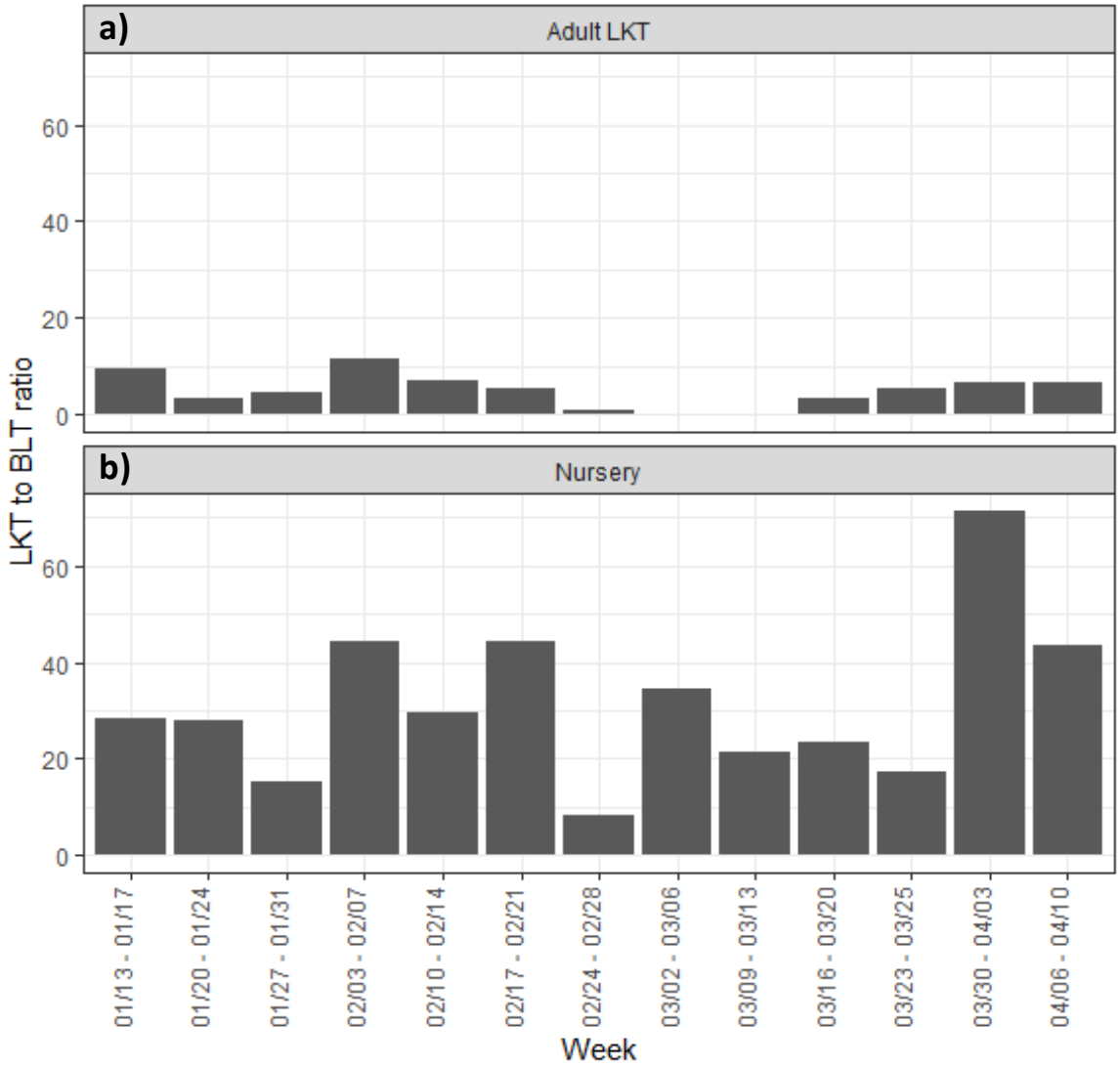

Figure 7: Lake Trout to Bull Trout catch ratios in Adult (a) and Nursery (b) netting during the spring 2020 gillnetting efforts.

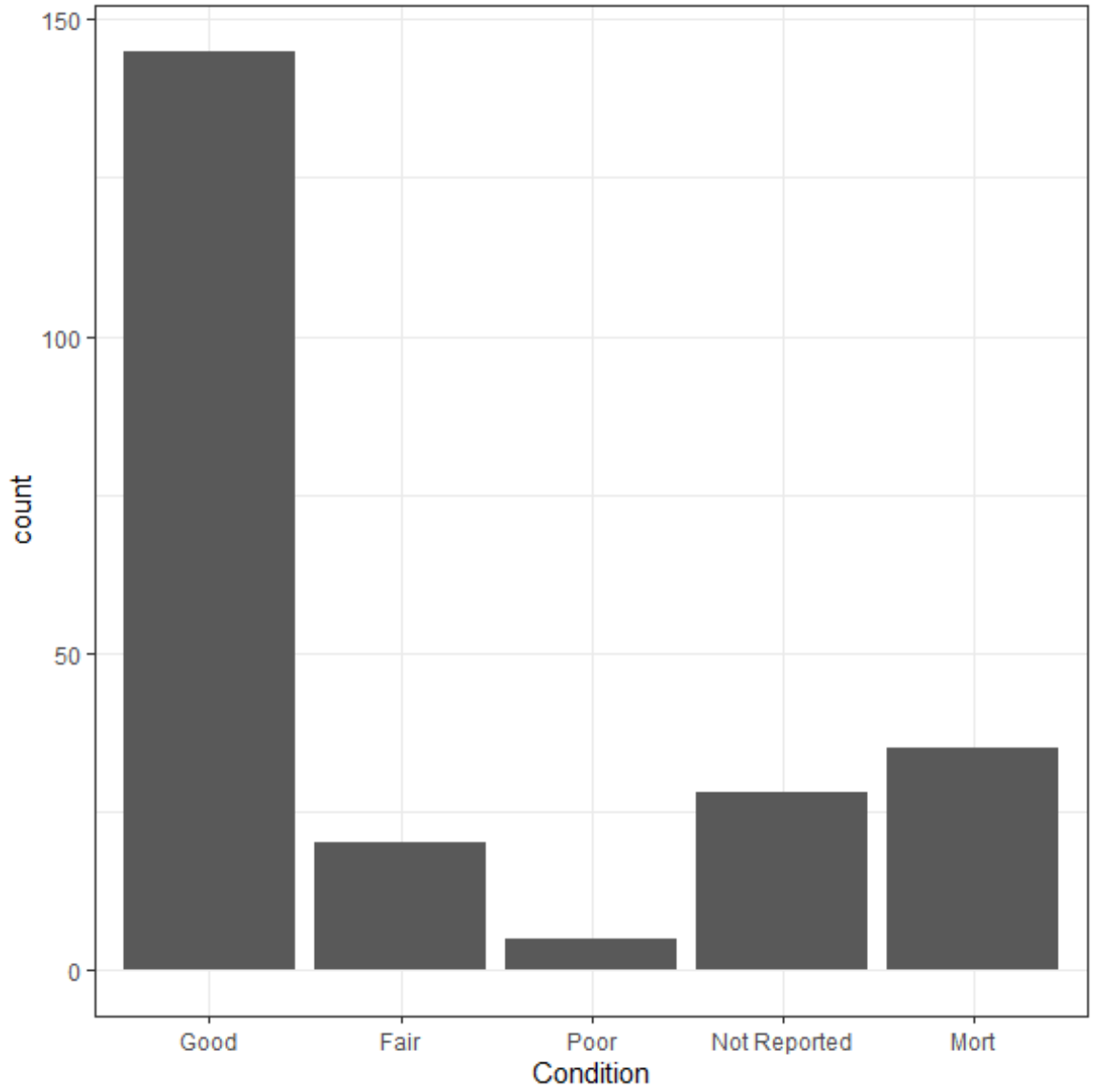

Figure 8: Condition index of Bull Trout captured during spring 2020 netting efforts.

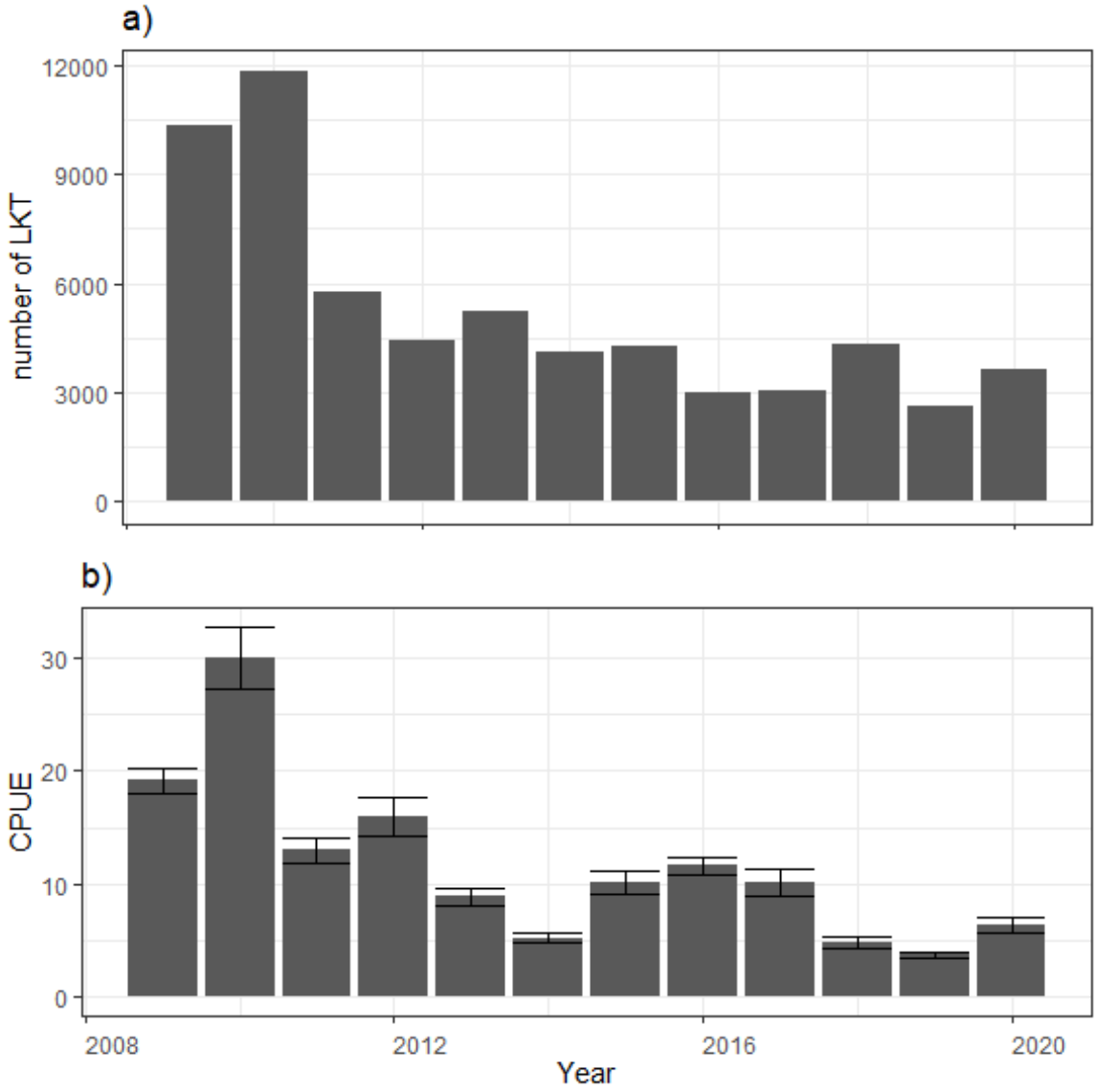

Figure 9: Annual catch (a) and mean CPUE (b) of Lake Trout during the designated spring gillnetting efforts from 2009–Present.

APPENDIX B: FALL 2020 LPO LAKE TROUT NETTING SUMMARY

9/7/2020–11/19/2020
Jeff Strait
01/21/2021

Overview

During the fall 2020, gillnet effort was divided into two categories based on the primary target and the mesh sizes fished. From 09/08 to 10/23 we targeted spawning Lake Trout (*Salvelinus namaycush*) using 5.5 and 5.0 inch (139.7mm and 127mm) mesh gillnets (hereafter, Spawner). In the Spawner gillnetting sets, a total of 1,241 Lake Trout were removed ranging from 219 mm to 1,005 mm total length using an effort of 617,400 ft (188,183.52 m) of net.

From 10/26 to 11/19 we fished 2.5 and 2.0 inch (63.5 mm and 50.8 mm) mesh gillnets to target juvenile Lake Trout in the nurseries (hereafter, LKT Suppression). In the LKT suppression gillnetting, sets a total of 2,678 Lake Trout were removed ranging from 205 mm to 730 mm total length using an effort of 376,200 ft (114,665.76 m) of net. A grand total of 3,919 Lake Trout were removed during the fall 2020 netting season.

In addition to the Lake Trout suppression efforts, we tagged and released 12 Lake Trout with sonic tags to assist in spawning Lake Trout telemetry efforts and guide spawner suppression in the future. We also recaptured and released 1 previously sonic-tagged Lake Trout and recaptured and removed 3 previously sonic-tagged Lake Trout.

As part of the bycatch during these efforts, nine different species were captured including ESA Threatened Bull Trout (*Salvelinus confluentus*). A total of 778 Bull Trout were captured during the Lake Trout suppression efforts with an average direct mortality rate of 26.61%. We PIT tagged 430 and recaptured 168 previously tagged Bull Trout. Bull Trout condition was broken down as following:

- Good = 420
- Fair = 102
- Poor = 41
- Not Reported = 0
- Mortalities = 207 (mort recaps = 34)

The following tables and figures provide summary information on catch and bycatch from gillnet efforts during the complete fall 2020 netting season.

Tables

Table 1: Summary of the fall 2020 gillnetting for Spawner and general LKT Suppression netting sets. For each species, statistics include the number captured (Captured), released alive (Released), tagged with PIT tags (Tagged), recaptured PIT-tagged (Recaptured), and removed from LPO (Removed). For species other than Lake Trout, Walleye, and Northern Pike, the number of individuals removed represents fish that were "dead on capture".

Project	Species	Captured	Released	Tagged	Recaptured	Removed
Spawner	Lake Trout	1,241	14	0	0	1,227
	Bull Trout	459	350	218	136	109
	Rainbow Trout	63	36	0	0	27
	kokanee	62	52	0	0	10
	Smallmouth Bass	44	44	0	0	0
	Walleye	17	0	0	0	17
	Brown Trout	11	4	0	0	7
	Westslope Cutthroat Trout	3	1	0	0	2
	Bull X Brook Trout	1	0	0	0	1
LKT Suppression	Lake Trout	2,678	0	0	0	2,678
	Bull Trout	319	214	183	31	105
	kokanee	86	58	0	0	28
	Brown Trout	4	3	0	0	1
	Walleye	4	0	0	0	4
	Bull X Brook Trout	1	1	0	0	0
	Rainbow Trout	1	1	0	0	0

Table 2: Totals of the fall 2020 gillnetting statistics for Spawner and general LKT Suppression netting sets. For each species, statistics include the number captured (Captured), released alive (Released), tagged with PIT tags (Tagged), recaptured PIT-tagged (Recaptured), and removed from LPO (Removed). For species other than Lake Trout, Walleye, and Northern Pike, the number of individuals removed represents fish that were "dead on capture".

Species	Captured	Released	Tagged	Recaptured	Removed
Lake Trout	3,919	14	0	0	3,905
Bull Trout	778	564	401	167	214
kokanee	148	110	0	0	38
Rainbow Trout	64	37	0	0	27
Smallmouth Bass	44	44	0	0	0
Walleye	21	0	0	0	21
Brown Trout	15	7	0	0	8
Westslope Cutthroat Trout	3	1	0	0	2
Bull X Brook Trout	2	1	0	0	1

Table 3: Summary of length (mm) data for Lake Trout, Bull Trout, and Bull Trout mortalities captured in gillnets during the fall 2020.

Project	Species	Mean TL	SE	Max TL	Min TL
Spawner	BLT	563.5	4.9	824	210
	BLT Mortalities	568.0	10.9	790	307
	LKT	658.6	3.4	1,005	219
LKT Suppression	BLT	366.6	7.4	692	208
	BLT Mortalities	346.4	7.9	640	202
	LKT	304.3	0.8	730	205

Table 4: Catch data for Lake Trout, Bull Trout, and Bull Trout mortalities from Spawner, general LKT Suppresion, and all gillnets combined (F20 All Nets) during the fall 2020. These statistics include the total number of Lake Trout (LKT), live Bull Trout (BLT), Bull Trout mortalities (BLT Morts), the mean catch ratios of Lake Trout to live Bull Trout (LKT:BLT), Lake Trout to Bull Trout mortalities (LKT:BLT Morts), and the mean proportion of Bull Trout captures that resulted in direct mortality (Prop Morts).

	LKT	BLT	BLT Morts	LKT:BLT	LKT:BLT Morts	Prop Morts
Spawner	1,241	350	107	3.55	11.60	0.23
LKT Suppression	2,678	214	103	12.51	26.00	0.32
F20 All Nets	3,919	564	210	6.95	18.66	0.27

Table 5: Catch Per Unit Effort statistics for Lake Trout, Bull Trout, and Bull Trout mortalities from Spawner, general LKT Suppression, and all gillnets combined (F20 All Nets) during the fall 2020. These statistics include the total number of 274 m gillnet panels fished (Effort), and the Mean and SE of daily catch per unit effort (# fish / 274 m of net) for Lake Trout (LKT CPUE, LKT SE), Bull Trout (BLT CPUE, BLT SE), and Bull Trout mortalities (BLT Mort CPUE, BLT Mort SE).

	Effort	LKT CPUE	LKT SE	BLT CPUE	BLT SE	BLT Mort CPUE	BLT Mort SE
Spawner	715	1.81	0.17	0.53	0.05	0.17	0.03
LKT Suppression	418	6.33	0.96	0.52	0.05	0.26	0.04
F20 All Nets	1,133	2.83	0.29	0.53	0.04	0.19	0.02

Table 6: Catch data for Lake Trout, Bull Trout, and Bull Trout mortalities for each gillnet mesh size (inches) fished during the fall 2020. These statistics include the total number of Lake Trout (LKT), live Bull Trout (BLT), Bull Trout mortalities (BLT Morts), the mean catch ratios of Lake Trout to live Bull Trout (LKT:BLT), Lake Trout to Bull Trout mortalities (LKT:BLT Morts), and the mean proportion of Bull Trout captures that resulted in direct mortality (Prop Morts).

Mesh Size (in)	LKT	BLT	BLT Morts	LKT:BLT	LKT:BLT Morts	Prop Morts
5.5	602	162	47	3.72	12.81	0.22
5.0	639	188	60	3.40	10.65	0.24
2.5	922	103	55	8.95	16.76	0.35
2.0	1,756	111	48	15.82	36.58	0.30

Table 7: Catch Per Unit Effort statistics for Lake Trout, Bull Trout, and Bull Trout mortalities for each gillnet mesh size (inches) fished during the fall 2020. These statistics include the total number of 274 m gillnet panels fished (Effort), and the Mean and SE of daily catch per unit effort (# fish / 274 m of net) for Lake Trout (LKT CPUE, LKT SE), Bull Trout (BLT CPUE, BLT SE), and Bull Trout mortalities (BLT Mort CPUE, BLT Mort SE).

Mesh Size (in)	Effort	LKT CPUE	LKT SE	BLT CPUE	BLT SE	BLT Mort CPUE	BLT Mort SE
5.5	355	1.70	0.20	0.47	0.06	0.14	0.03
5.0	360	1.92	0.28	0.60	0.08	0.19	0.04
2.5	209	4.40	0.58	0.49	0.06	0.30	0.07
2.0	209	8.26	1.74	0.56	0.07	0.23	0.05

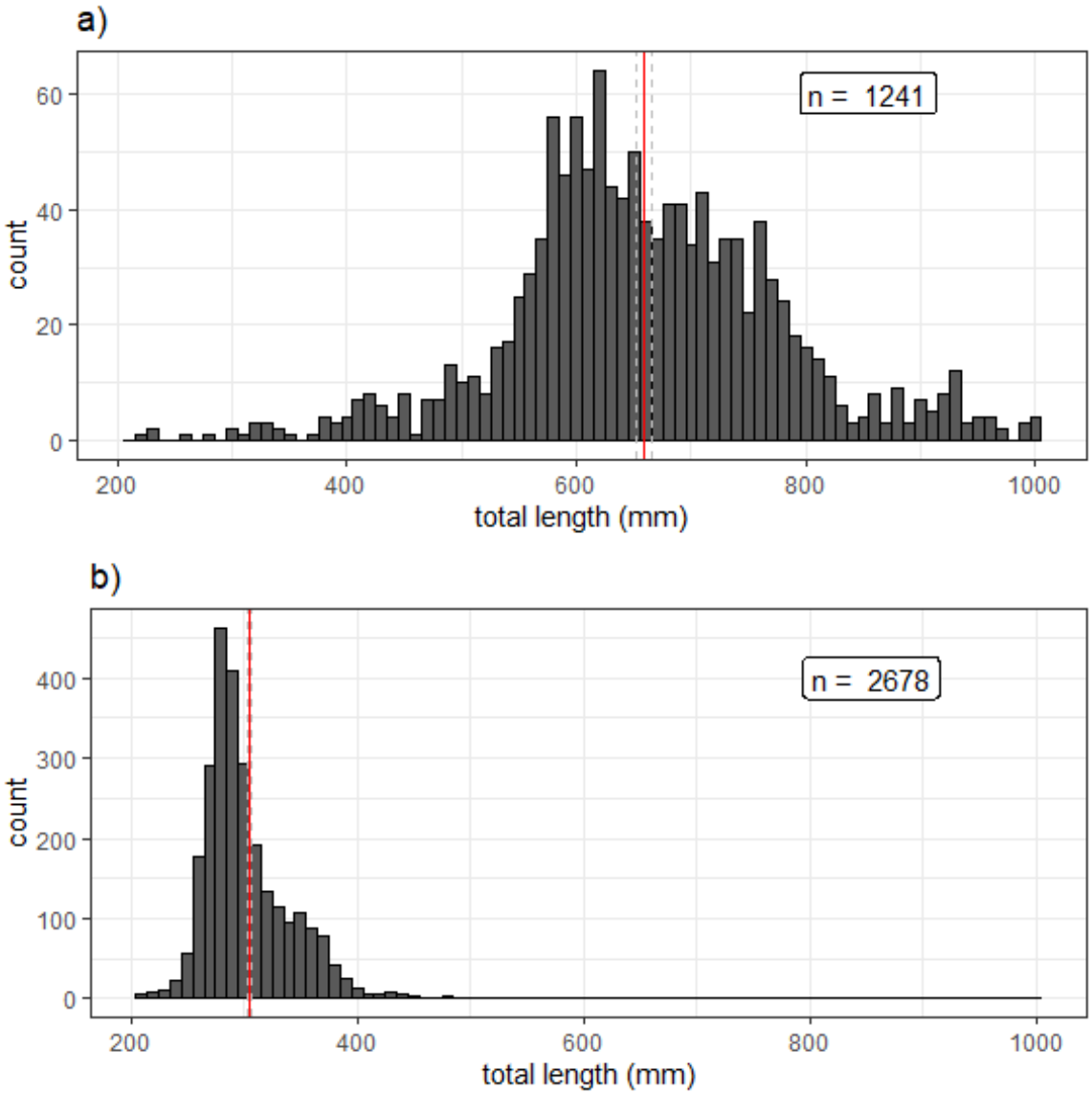

Figure 1: Length frequency distributions of Lake Trout captured in gillnets during fall 2020 Spawner (a) and general LKT Suppression (b) netting efforts. The vertical red lines represent the mean total length (mm) for each group and the dashed grey lines represent two standard errors above and below the sample mean. Note: only small mesh (2.0 and 2.5 inch) was fished during the general LKT Suppression gillnetting efforts.

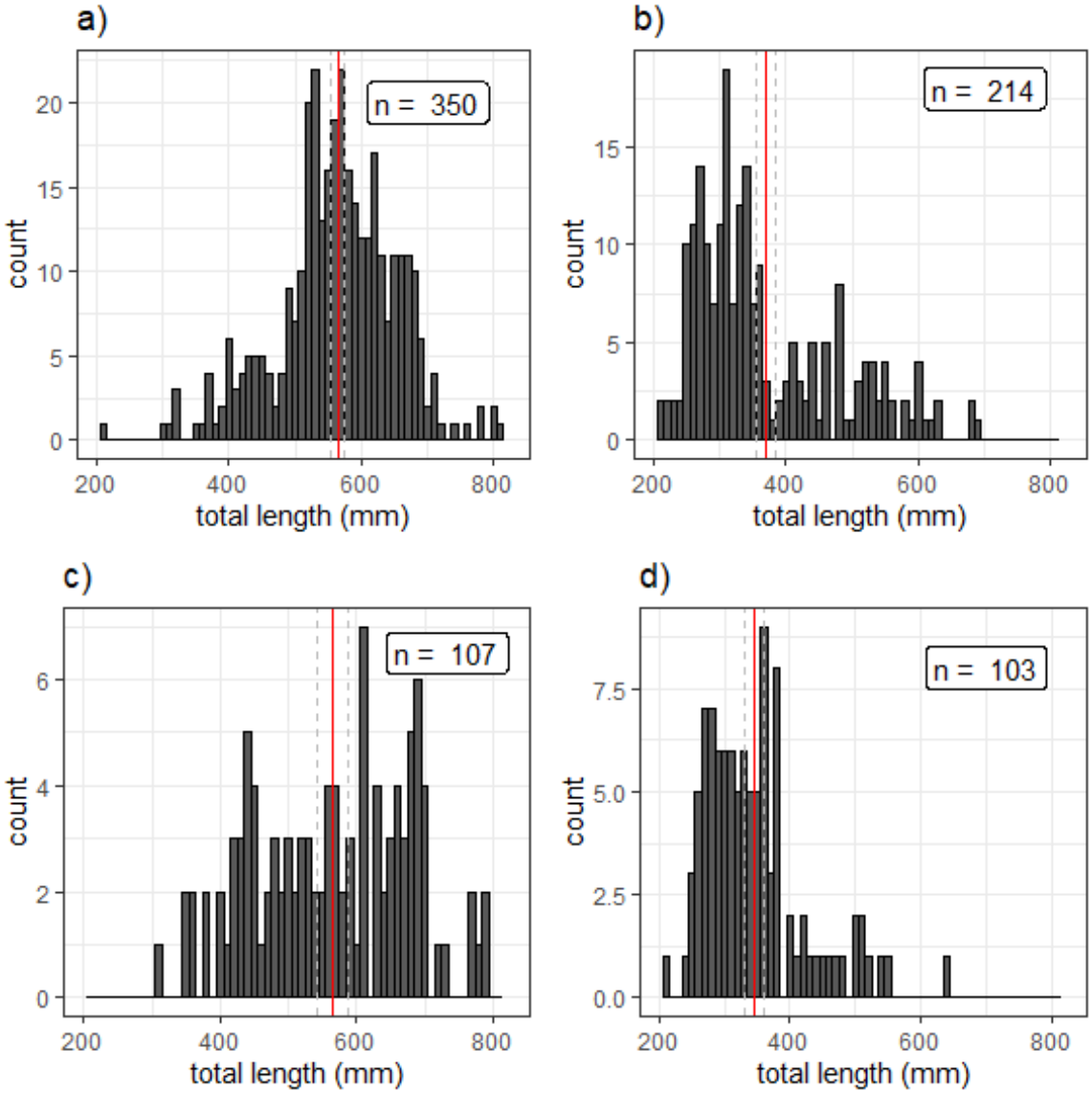

Figure 2: Length frequency distributions of Bull Trout captured in gillnets during fall 2020 netting efforts. Panels a) and b) are the length frequencies of Bull Trout **released alive** in the Spawner and general LKT Suppression netting efforts, respectively. Panels c) and d) are the length frequencies of Bull Trout **mortalities** in the Spawner and general LKT Suppression netting efforts, respectively. The vertical red lines represent the mean total length (mm) for each group and the dashed grey lines represent two standard errors above and below the sample mean.

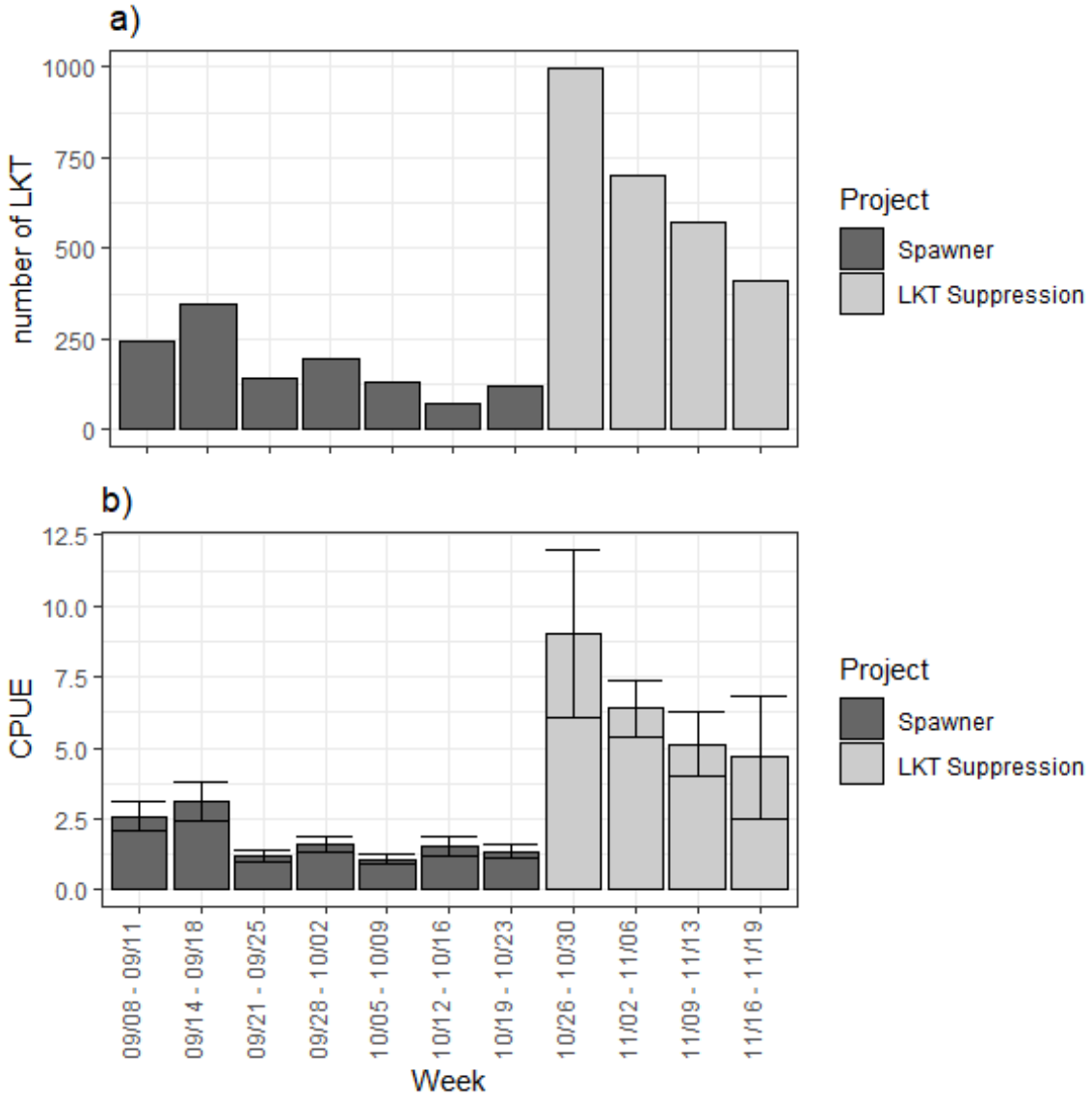

Figure 3: Total weekly catch (a) and mean weekly catch per unit effort with standard error bars (b, number of LKT per 274 m of gillnet) of Lake Trout captured during the fall 2020 gillnetting efforts.

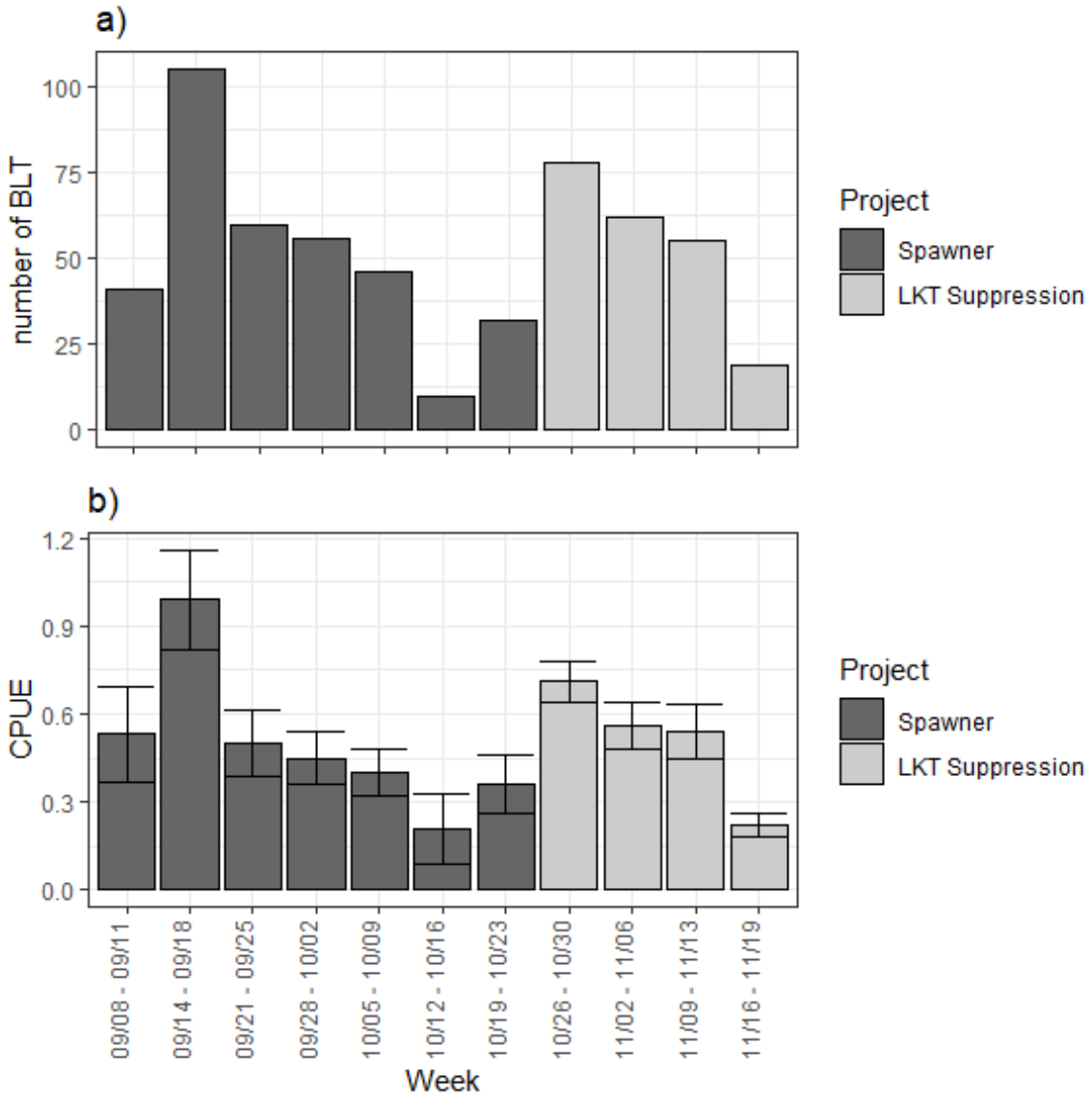

Figure 4: Total weekly catch (a) and mean weekly catch per unit effort with standard error bars (b, number of BLT per 274 m of gillnet) of Bull Trout captured and released alive during the fall 2020 gillnetting efforts.

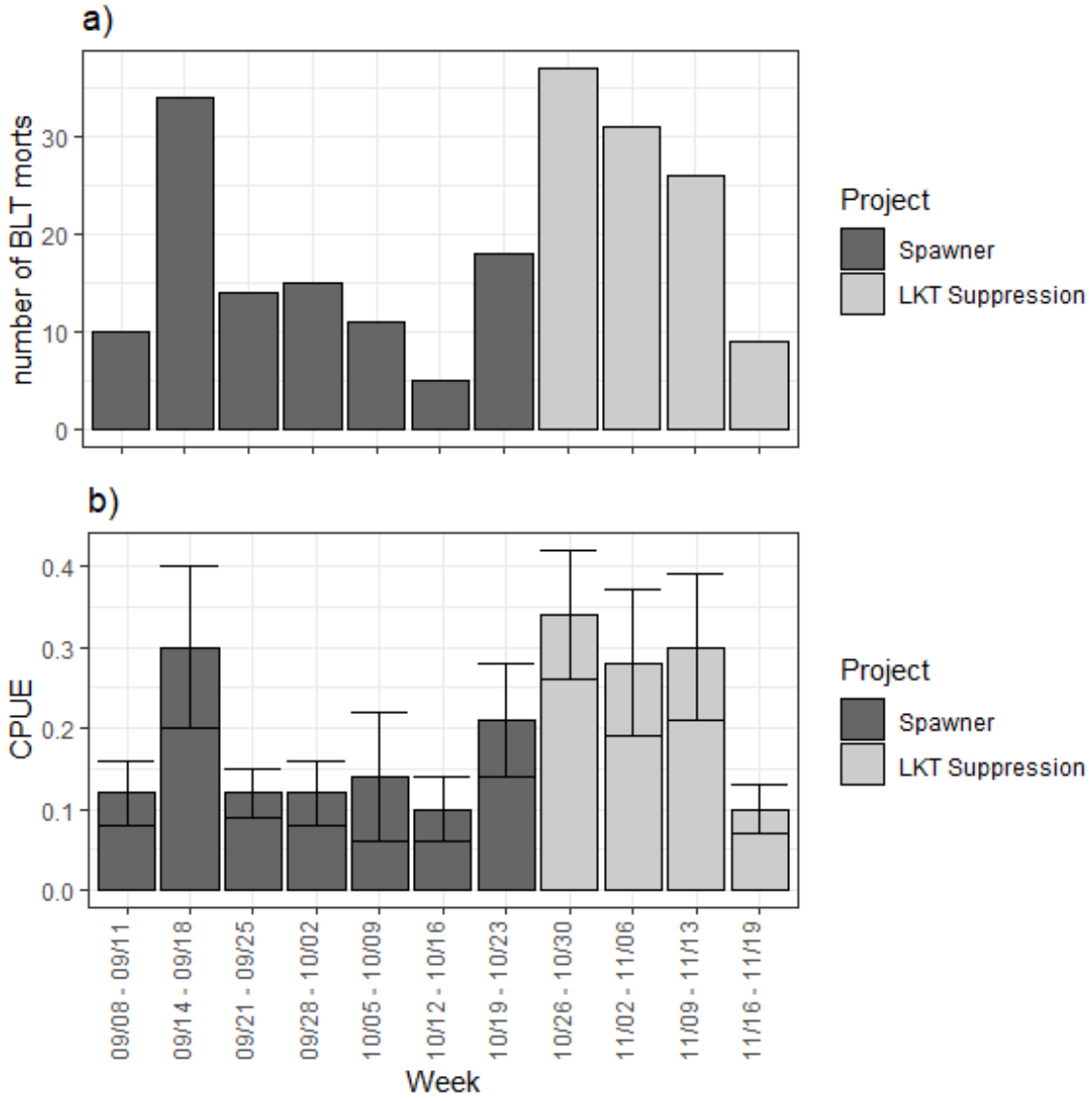

Figure 5: Total weekly catch (a) and mean weekly catch per unit effort with standard error bars (b, number of BLT per 274 m of gillnet) of Bull Trout mortalities during the fall 2020 gillnetting efforts.

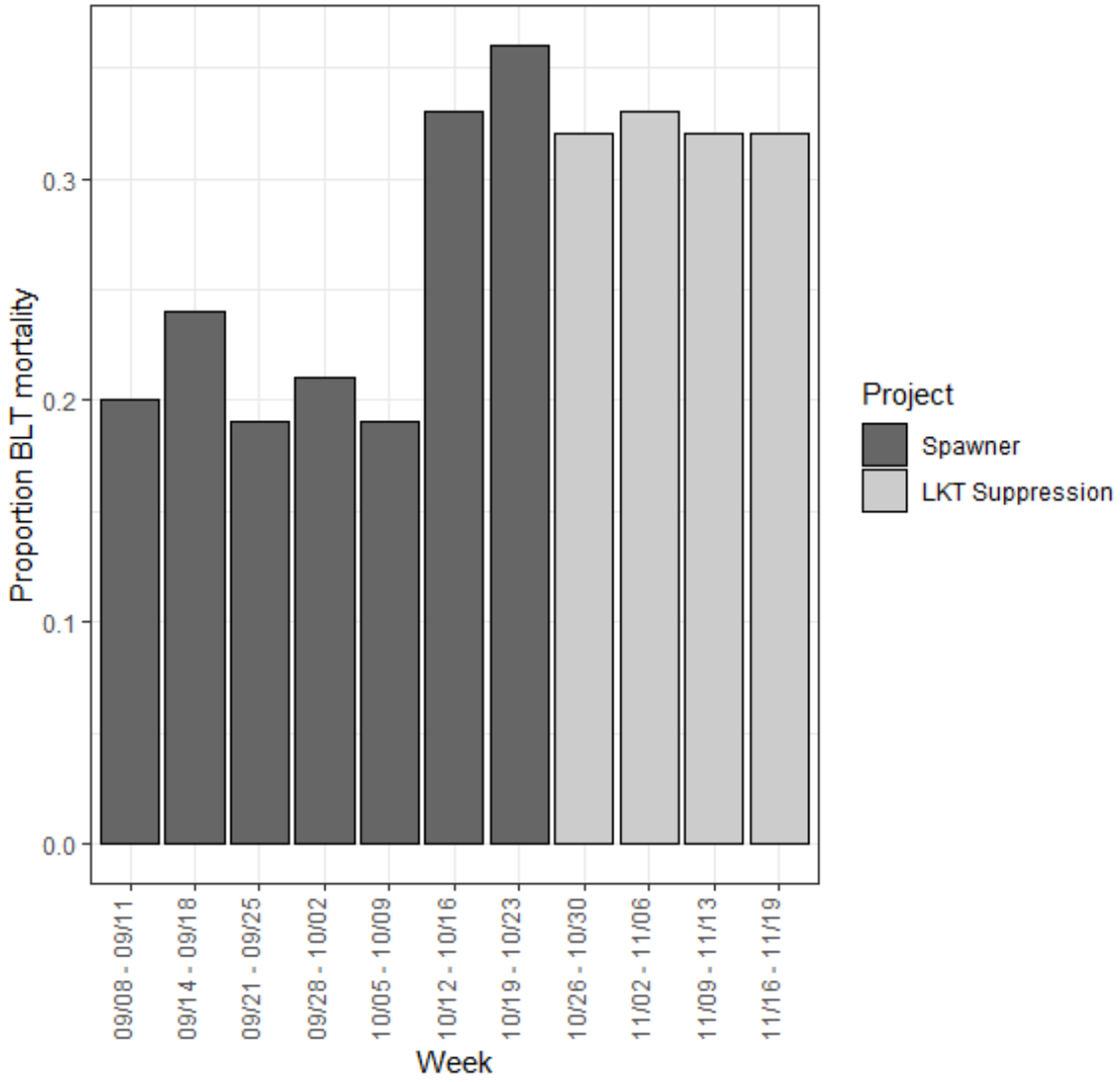

Figure 6: The weekly mean proportion of Bull Trout bycatch resulting in mortality during the Spawner and general LKT Suppression during the fall 2020 gillnetting efforts.

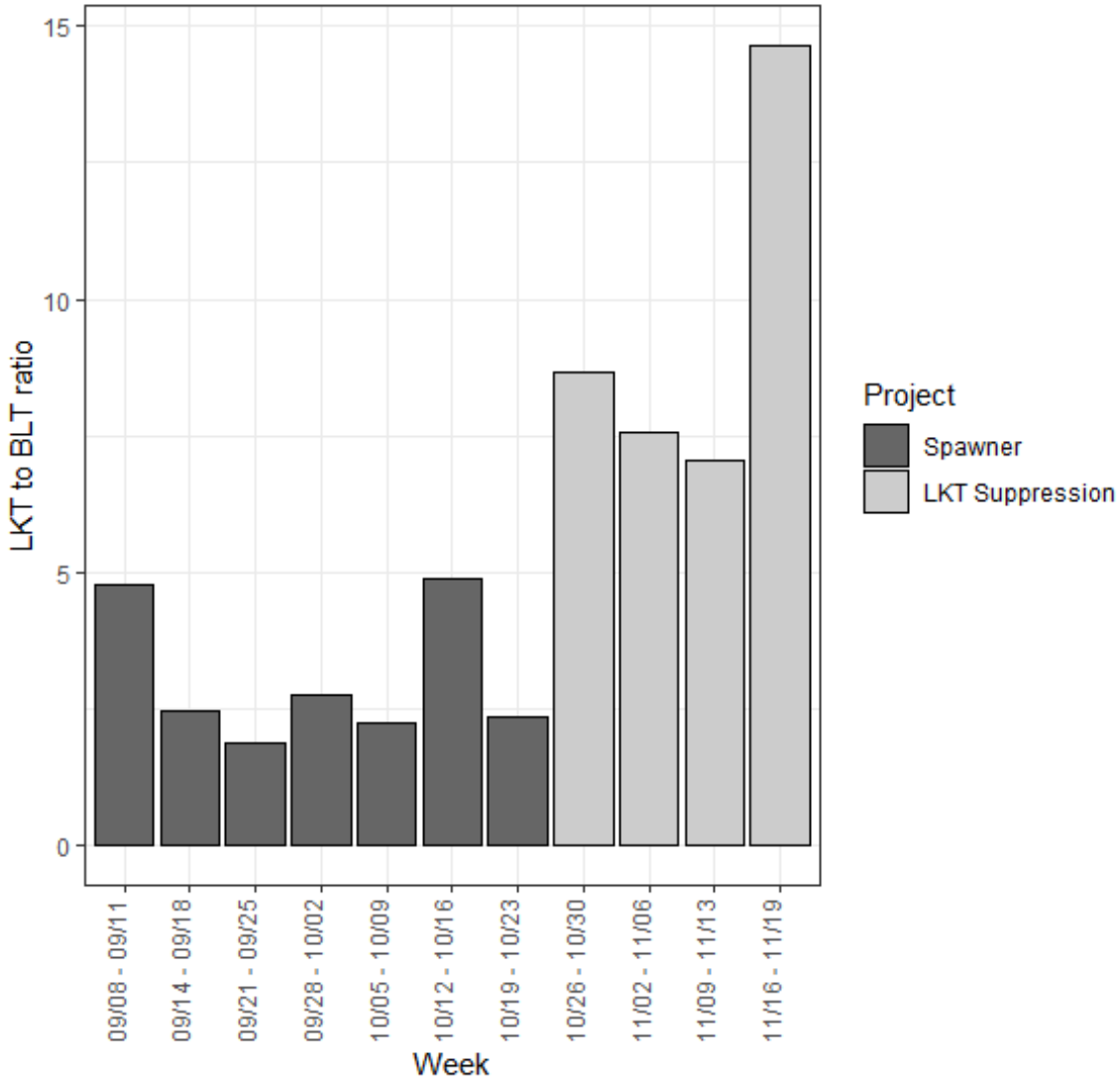

Figure 7: The weekly mean Lake Trout to Bull Trout catch ratios in Spawner and general LKT Suppression during the fall 2020 gillnetting efforts.

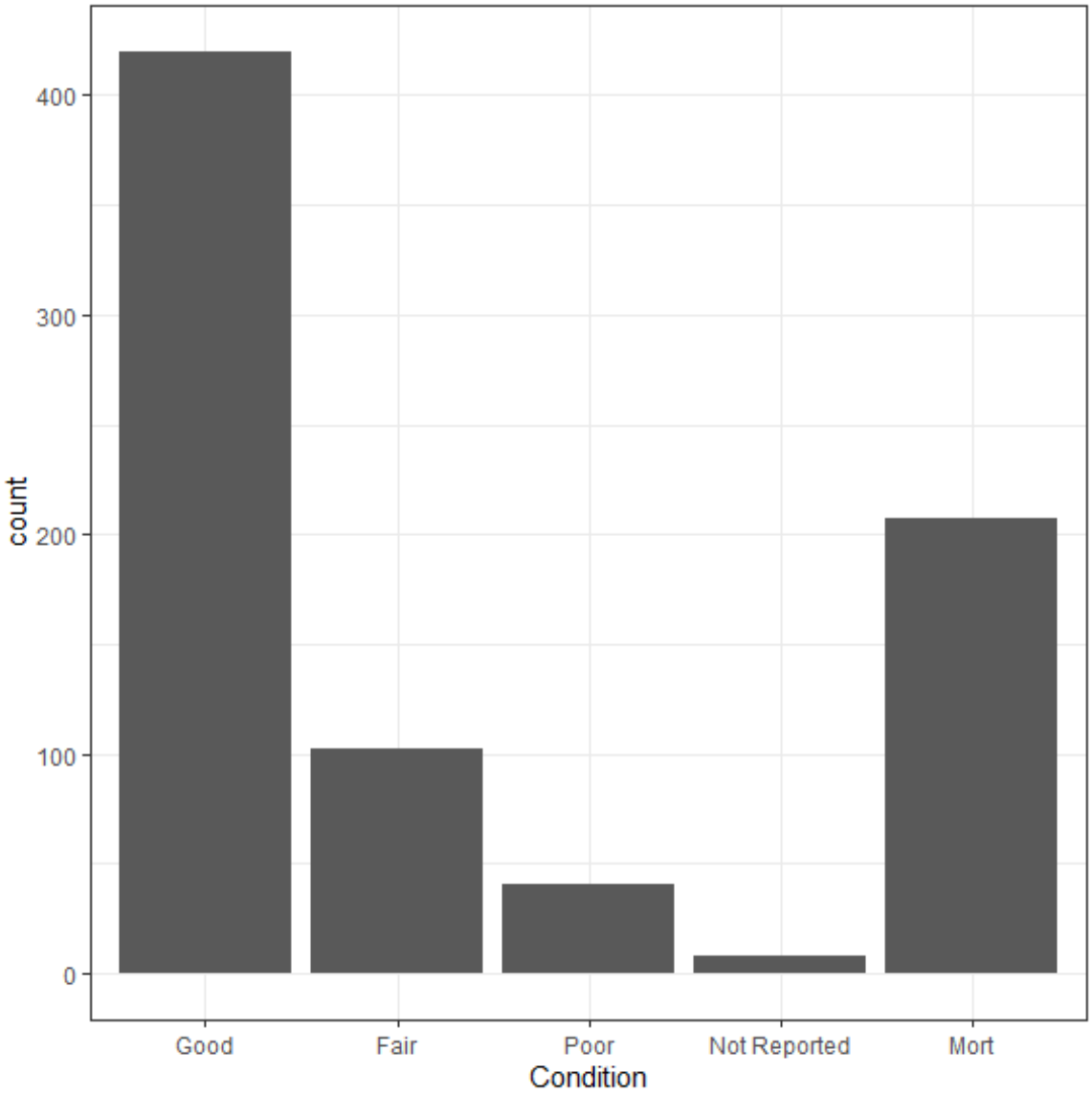

Figure 8: Condition index of Bull Trout captured during fall 2020 gillnetting efforts.

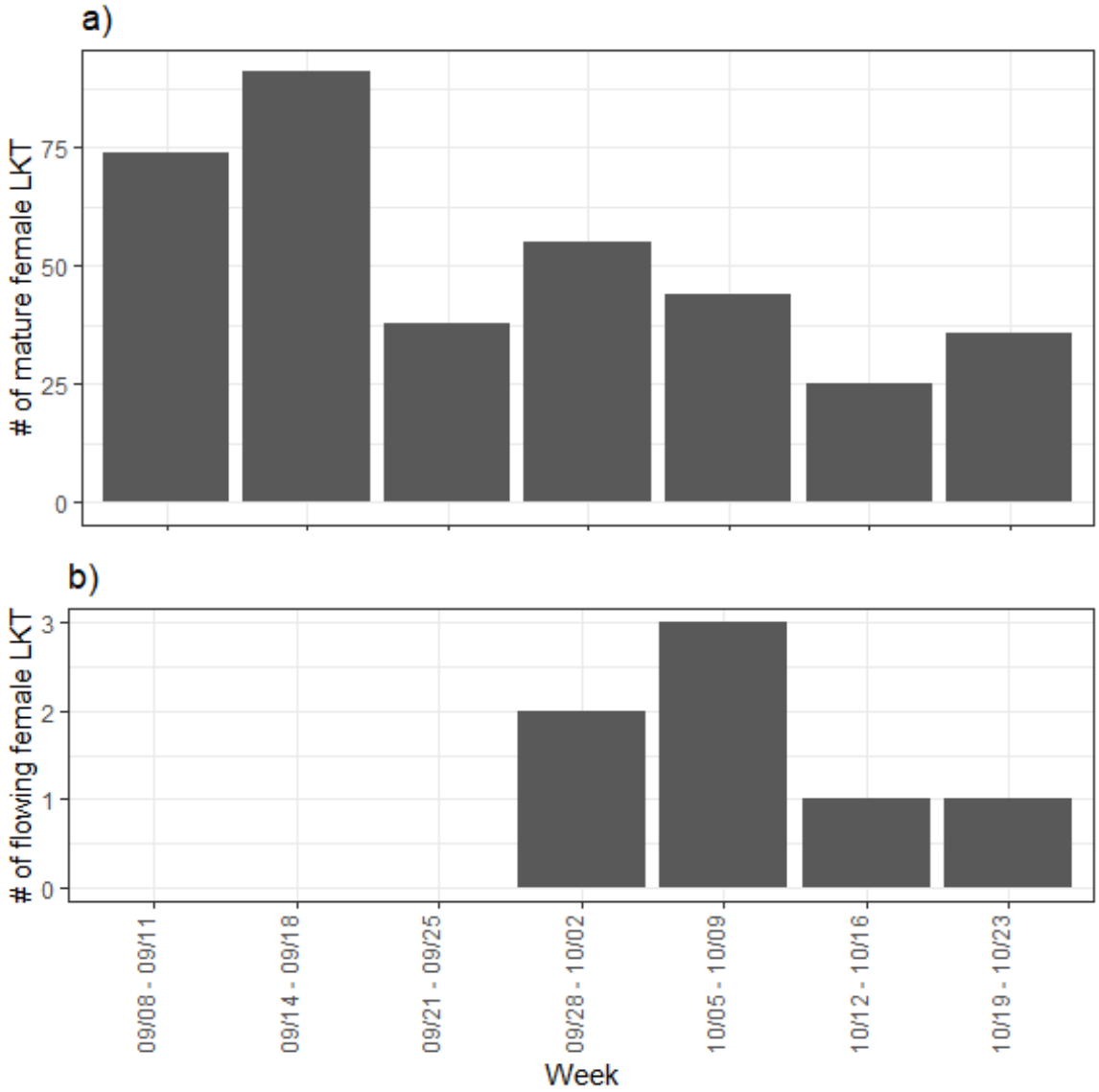

Figure 9: The weekly catch of mature female Lake Trout (a) and mature female Lake Trout that were flowing at time of capture (b) during the fall 2020 Spawner gillnetting efforts.

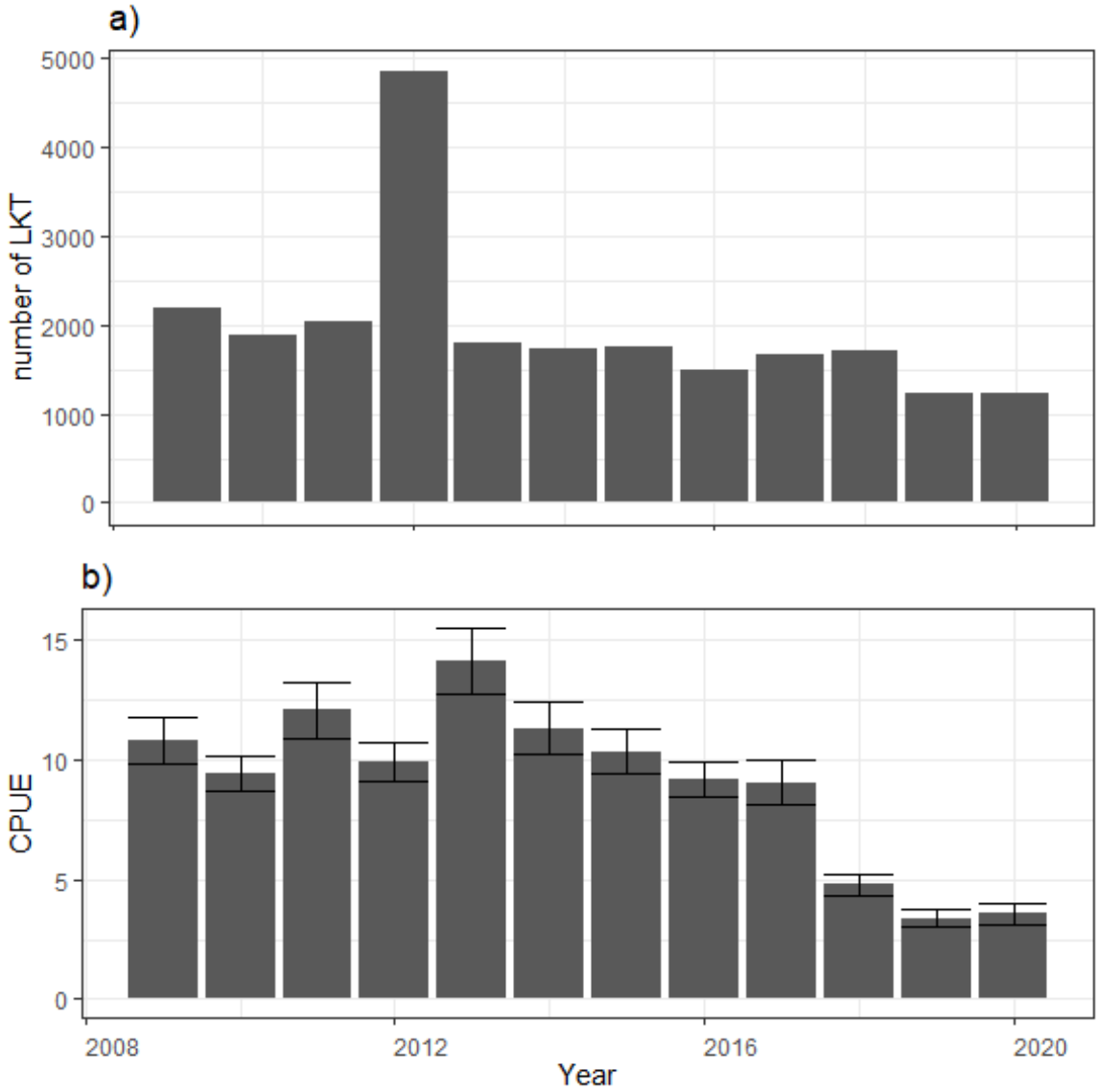

Figure 10: Annual catch (a) and mean catch per unit effort with standard error bars (b, number of LKT per 274 m of gillnet) of Lake Trout during the designated fall Spawner gillnetting efforts from 2009–2020.

APPENDIX C: FALL 2020 LPO ASSESSMENT NETTING SUMMARY

11/30/2020–12/18/2020
Jeff Strait
02/02/2021

Overview

During fall randomized assessment netting 2020, we set gill nets along the shoreline (in water depths ranging from 18 m to 76 m) in randomly selected locations (stratified to include approximately 40% of sites from the shallow "north end" and 60% of sites from the remainder of the lake). These gill nets were constructed of 300 ft (91.44 m) panels of translucent stretch mesh ranging from 1.5 (38.1 mm) to 5.5 (139.7 mm) inches. Each panel contained a single size (in) mesh (i.e., 1.5, 1.75, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5) and panels were strung together to create 900 ft (274.32 m) "boxes." Boxes were randomly strung together to create a ten box "gang," and a single gang was set at each randomly selected site. Each gang contained equal effort (900 ft) of the aforementioned mesh sizes. This stratified random netting effort is hereafter referred to as LKT assessment netting.

During assessment netting, a total of 777 Lake Trout (*Salvelinus namaycush*) ranging from 91 mm to 1,030 mm were removed using an effort of 216,000ft (65,836.8m) of net. We collected otoliths from Lake Trout during assessment netting for aging purposes from fish throughout the lake, on both the north and south end. Lake Trout sizes were divided by 50 mm length bins with a goal of 10 otoliths per length bin. We collected 153 otoliths from 17 sites out of 24 total sites.

In addition, in order to develop an index of Lake Whitefish (*Coregonus clupeaformis*) abundance in Lake Pend Oreille, we counted Lake Whitefish caught as bycatch during assessment netting a stratified random subset of sites. On days we enumerated Lake Whitefish, we measured fish from one 300-ft net of each mesh size. We caught a total of 4,756 Lake Whitefish ranging from 160 mm to 520 mm in 99,000ft (30,175.2 m) of net.

As part of the bycatch during these efforts, 12 different species were captured including ESA Threatened Bull Trout (*Salvelinus confluentus*). A total of 212 Bull Trout were captured during the assessment netting efforts with an average direct mortality rate of 27.36%. We PIT tagged 119 and recaptured 46 previously tagged Bull Trout. Bull Trout condition was broken down as following:

- Good = 132
- Fair = 10
- Poor = 12
- Not Reported = 0
- Mortalities = 58 (mort recaps = 12)

The following tables and figures provide summary information on catch and bycatch from gillnet efforts during the randomized LKT assessment netting 2020.

Sample Sites

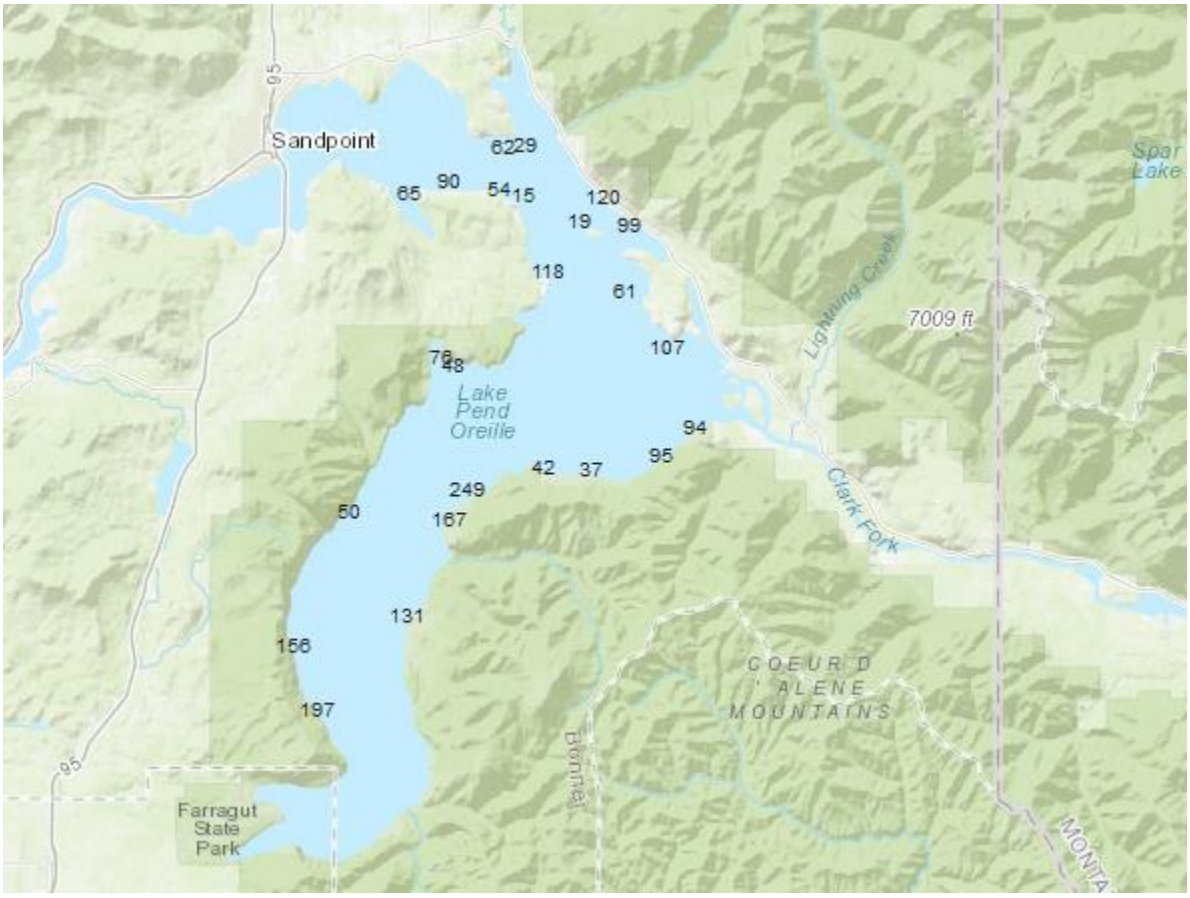

Figure 1: Map of Lake Pend Oreille showing the randomly selected sites for LKT assessment netting and labeled with the number of LKT captured at each site in 2020.

Figure 2: Map of Lake Pend Oreille showing the randomly selected subsample of sites used for Lake Whitefish index where LWF were enumerated and measured. Each site is labeled with the number of LWF captured in 2020.

Tables

Table 1: Summary of the 2020 LKT assessment gillnetting sets. For each species encountered, statistics include the number captured (Captured), released back into LPO (Released), tagged with PIT tags (Tagged), recaptured PIT-tagged individuals (Recaptured), and the number removed from LPO (Removed). For species other than Lake Trout, Walleye, and Northern Pike, the number of individuals removed represents fish that were "dead on capture".

Species	Captured	Released	Tagged	Recaptured	Removed
Lake Whitefish	4,757	3,914	0	0	843
kokanee	3,026	3,019	0	0	7
Lake Trout	777	0	0	0	777
Bull Trout	212	153	112	46	59
Walleye	21	0	0	0	21
Brown Trout	4	2	0	0	2
Northern Pike	3	0	0	0	3
Smallmouth Bass	3	3	0	0	0
Westslope Cutthroat Trout	3	1	0	0	2
Mountain Whitefish	2	2	0	0	0
Yellow Perch	1	1	0	0	0

Table 2: Summary of length (mm) data for Lake Trout, Bull Trout, Bull Trout mortalities, and Lake Whitefish captured in gillnets during the fall 2020 LKT assessment netting.

Species	Mean TL	SE	Max TL	Min TL
Lake Trout	385.3	5.0	1,030	91
Bull Trout	510.4	8.9	769	209
Bull Trout Mortalities	554.3	15.7	761	182
Lake Whitefish	301.6	1.0	520	160

Table 3: The mean daily catch per unit effort (CPUE, # fish / 274m of net) and standard error (SE) for Lake Trout (LKT), Bull Trout (BLT), Bull Trout mortalities (BLT Morts), and Lake Whitefish (LWF) by mesh size from gillnets during the 2020 LKT assessment netting efforts.

Mesh Size (in)	LKT CPUE	LKT SE	BLT CPUE	BLT SE	BLT Mort CPUE	BLT Mort SE	BLT Mortality Rate	LWF CPUE	LWF SE
1.5	2.79	0.68	0.12	0.12	0.00	0.00	0.00	58.640	40.110
1.75	3.46	1.14	0.21	0.08	0.08	0.06	0.25	78.730	34.970
2.0	7.92	1.75	0.46	0.26	0.17	0.10	0.28	105.450	43.430
2.5	5.21	0.97	0.67	0.20	0.21	0.08	0.26	61.000	19.760
3.0	4.71	1.05	0.75	0.28	0.29	0.14	0.31	55.360	14.620
3.5	2.46	0.70	0.62	0.17	0.58	0.19	0.48	38.270	7.610
4.0	2.42	0.91	0.79	0.20	0.58	0.26	0.39	22.550	6.110
4.5	1.88	0.64	1.29	0.30	0.21	0.17	0.06	11.550	7.240
5.0	0.92	0.34	0.88	0.19	0.17	0.10	0.10	0.640	0.360
5.5	0.62	0.18	0.58	0.26	0.12	0.07	0.25	0.180	0.180
Mean	3.24	0.84	0.64	0.21	0.24	0.12	0.24	43.237	17.439

Table 4: Catch statistics for LKT assessment netting 2018–2020.This includes the total number of Lake Trout caught (n), mean catch per unit effort (CPUE, # fish / 274m of net), and the standard error (SE).

Year	n	CPUE	SE
2018	628	2.61	0.31
2019	516	2.15	0.21
2020	777	3.24	0.32

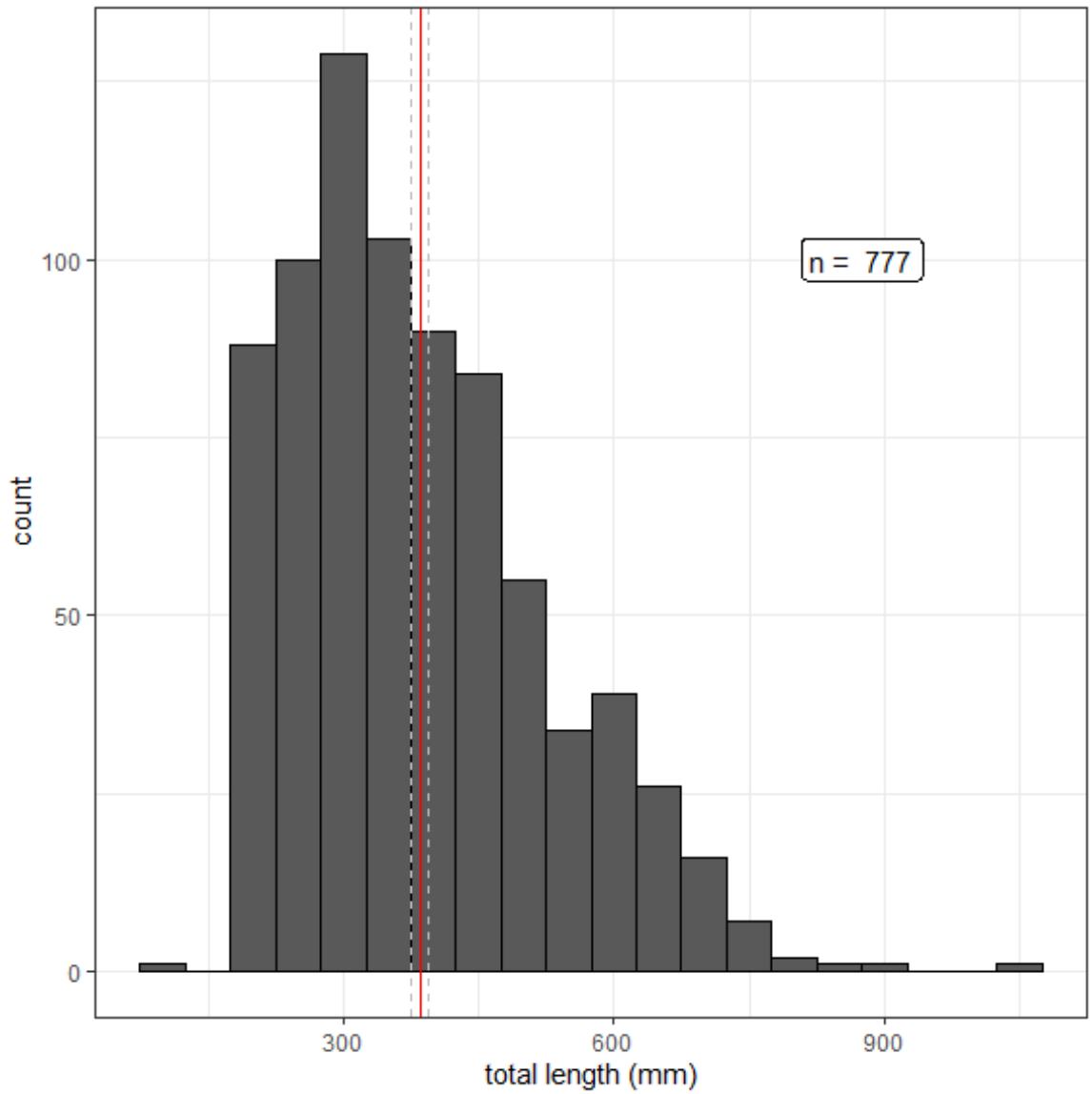

Figure 3: Length frequency distribution of Lake Trout captured in gillnets during the 2020 LKT assessment netting efforts. The vertical red line represents the mean total length (mm) and the dashed grey lines represent two standard errors above and below the sample mean.

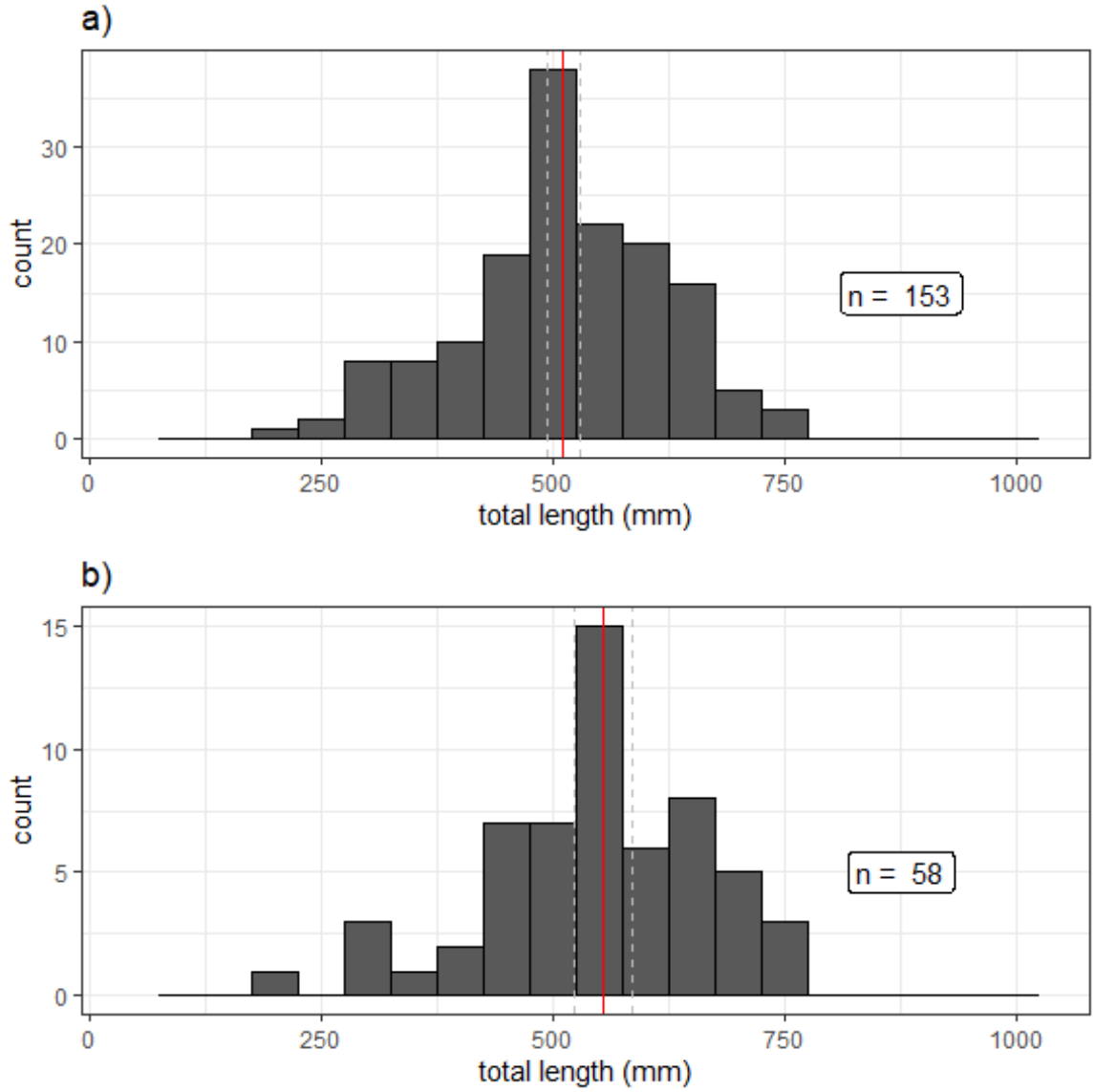

Figure 4: Length frequency distributions of Bull Trout captured in gillnets during the 2020 LKT assessment netting efforts. **Panel a)** is the length frequency of Bull Trout **released alive** and **panel b)** is the length frequency of Bull Trout **direct mortalities**. The vertical red lines represent the mean total length (mm) for each group and the dashed grey lines represent two standard errors above and below the sample mean.

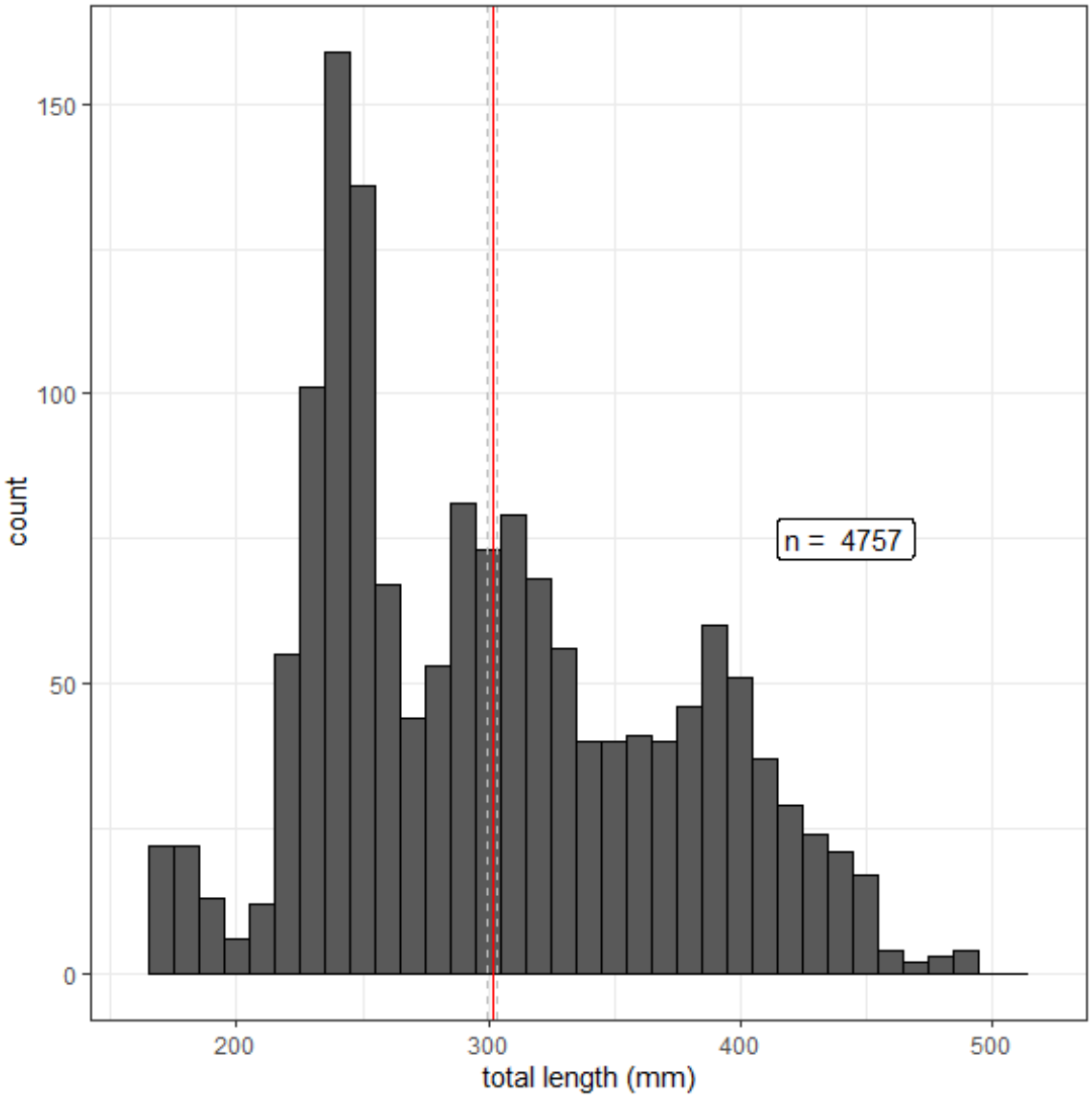

Figure 5: Length frequency distribution of Lake Whitefish captured and measured from a subset of the 2020 LKT assessment nets. The vertical red line represents the mean total length (mm) and the dashed grey lines represent two standard errors above and below the sample mean.

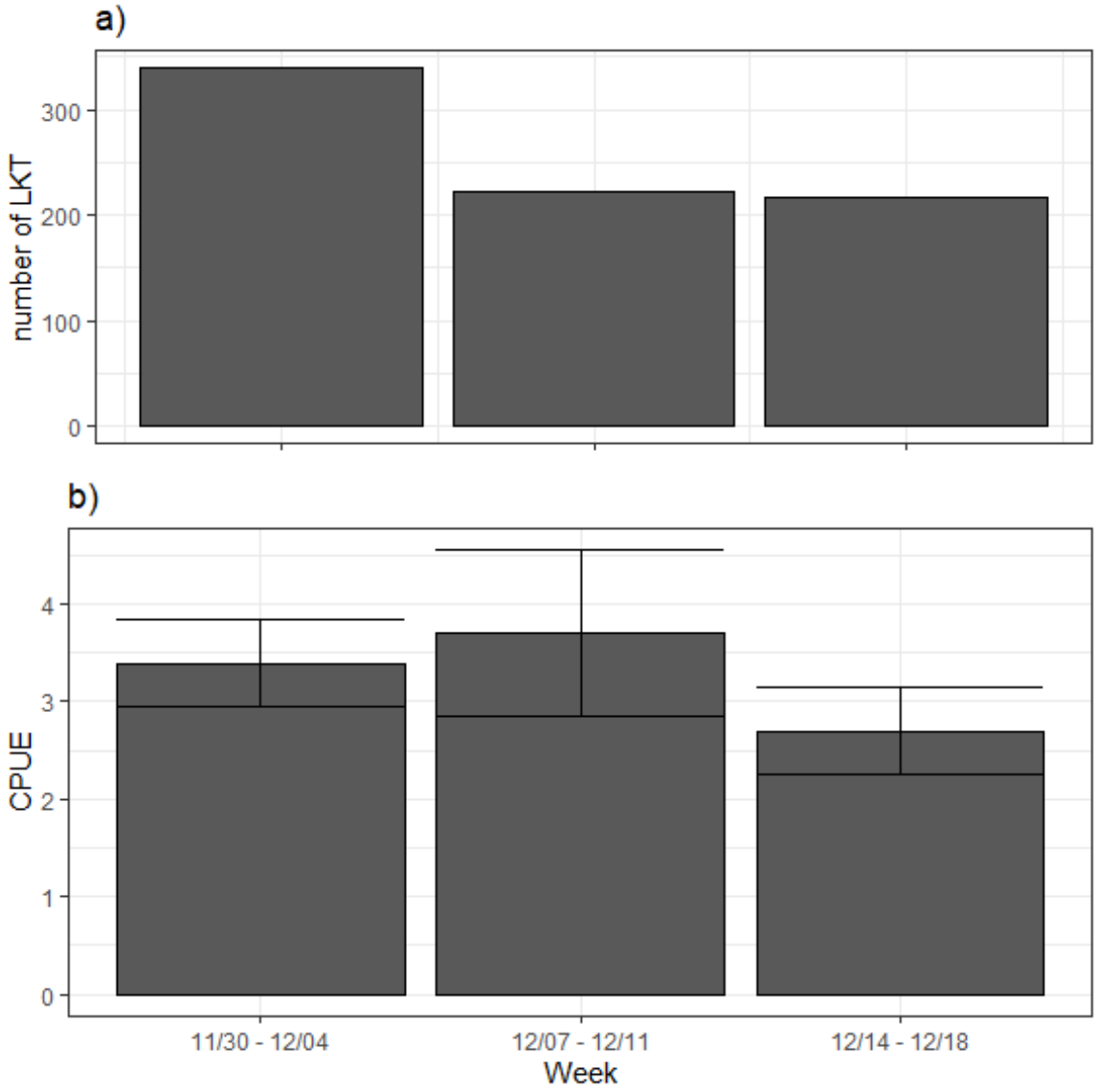

Figure 6: Total weekly catch (a) and mean weekly catch per unit effort with standard error bars (b, # fish per 274 m of gillnet) of Lake Trout captured in gillnets during the 2020 LKT assessment netting efforts.

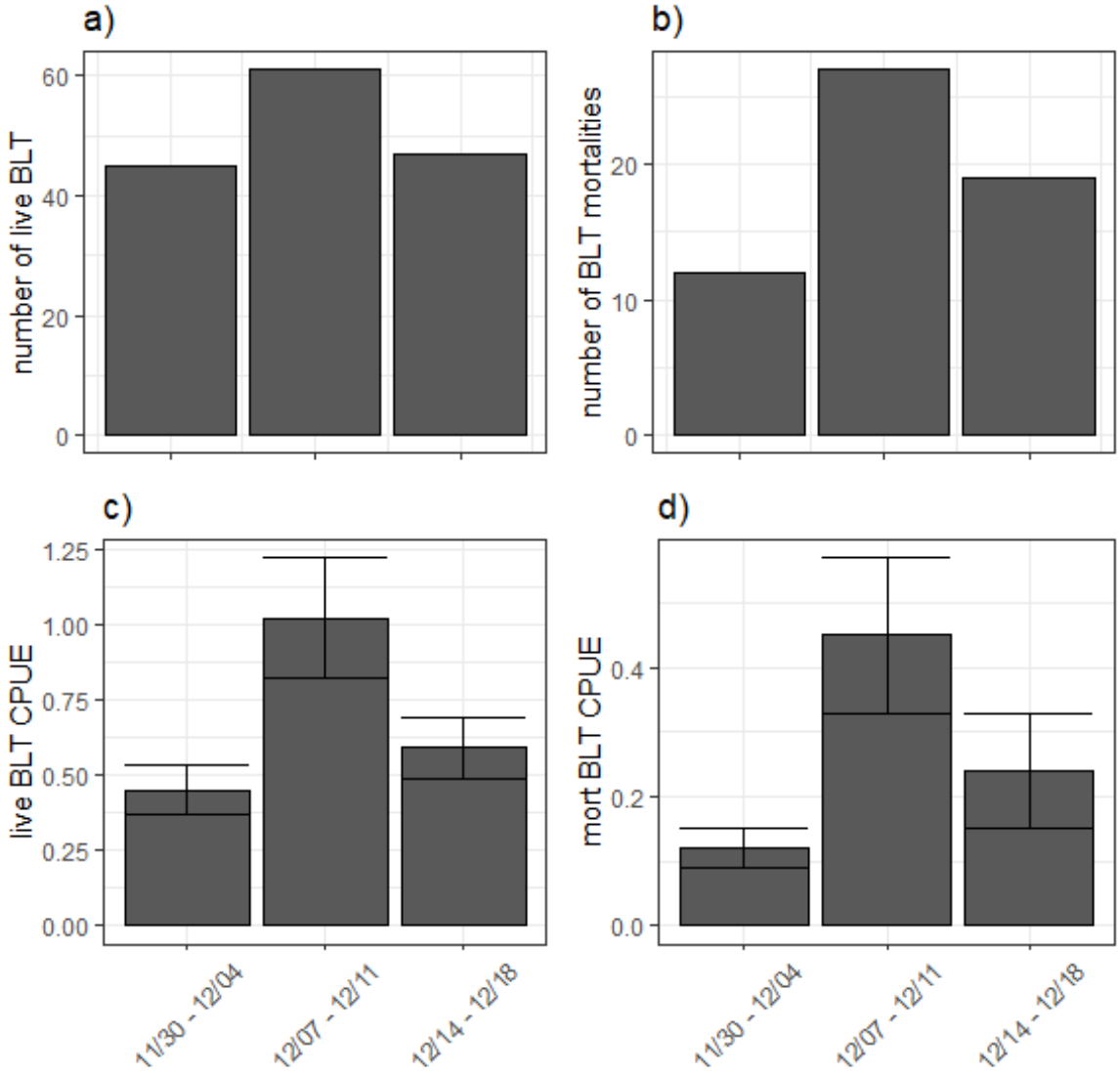

Figure 7: Total weekly catch of Bull Trout **released alive (a)** and **direct mortalities (b)**, and the mean weekly catch per unit effort with standard error bars (# fish per 274 m of gillnet) of Bull Trout captured and released alive (c) and direct mortalities (d) from gillnets during the 2020 LKT assessment netting efforts.

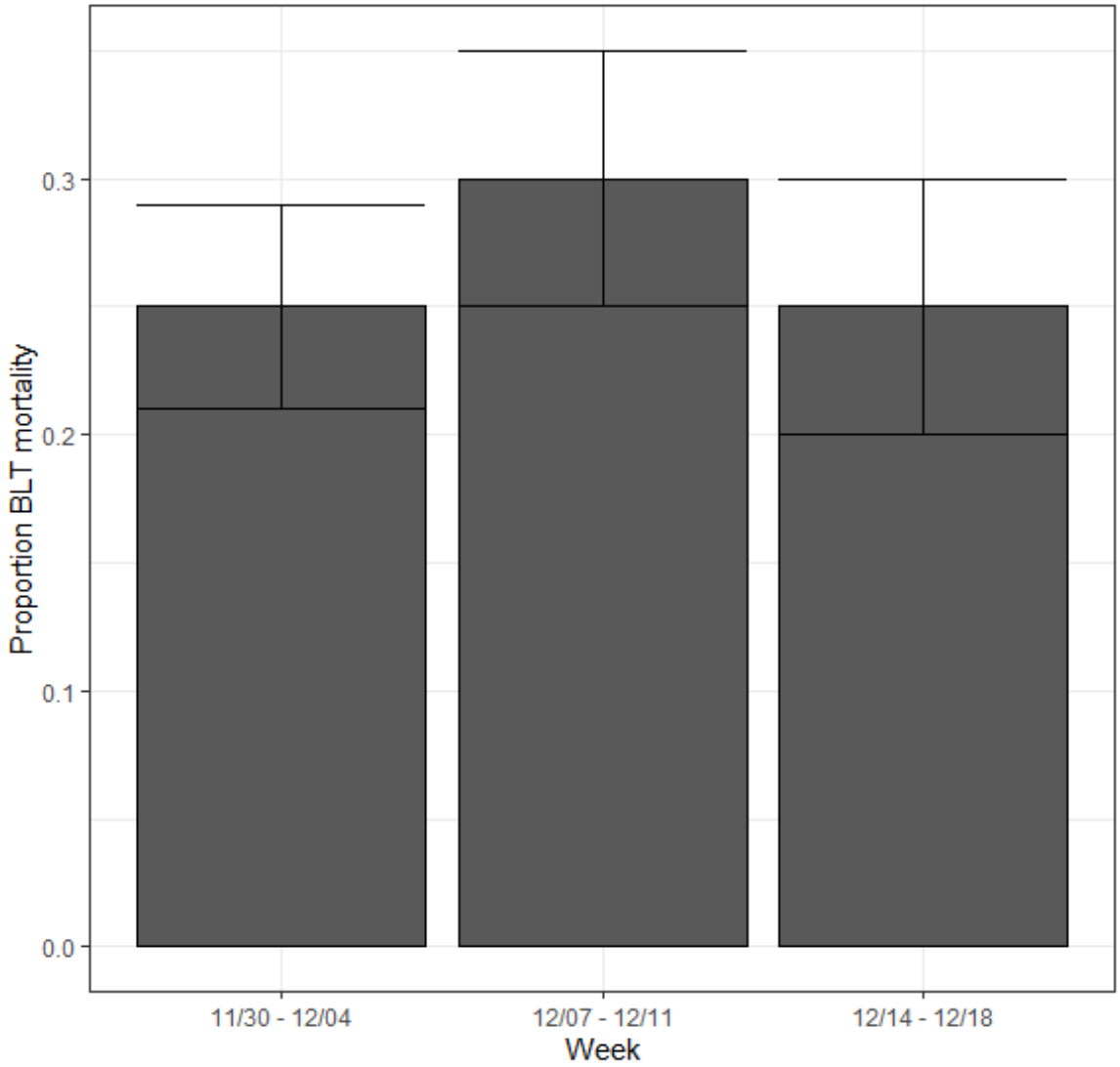

Figure 8: The mean (and standard error) proportion of Bull Trout bycatch resulting in direct mortality during each week of the 2020 LKT assessment netting efforts.

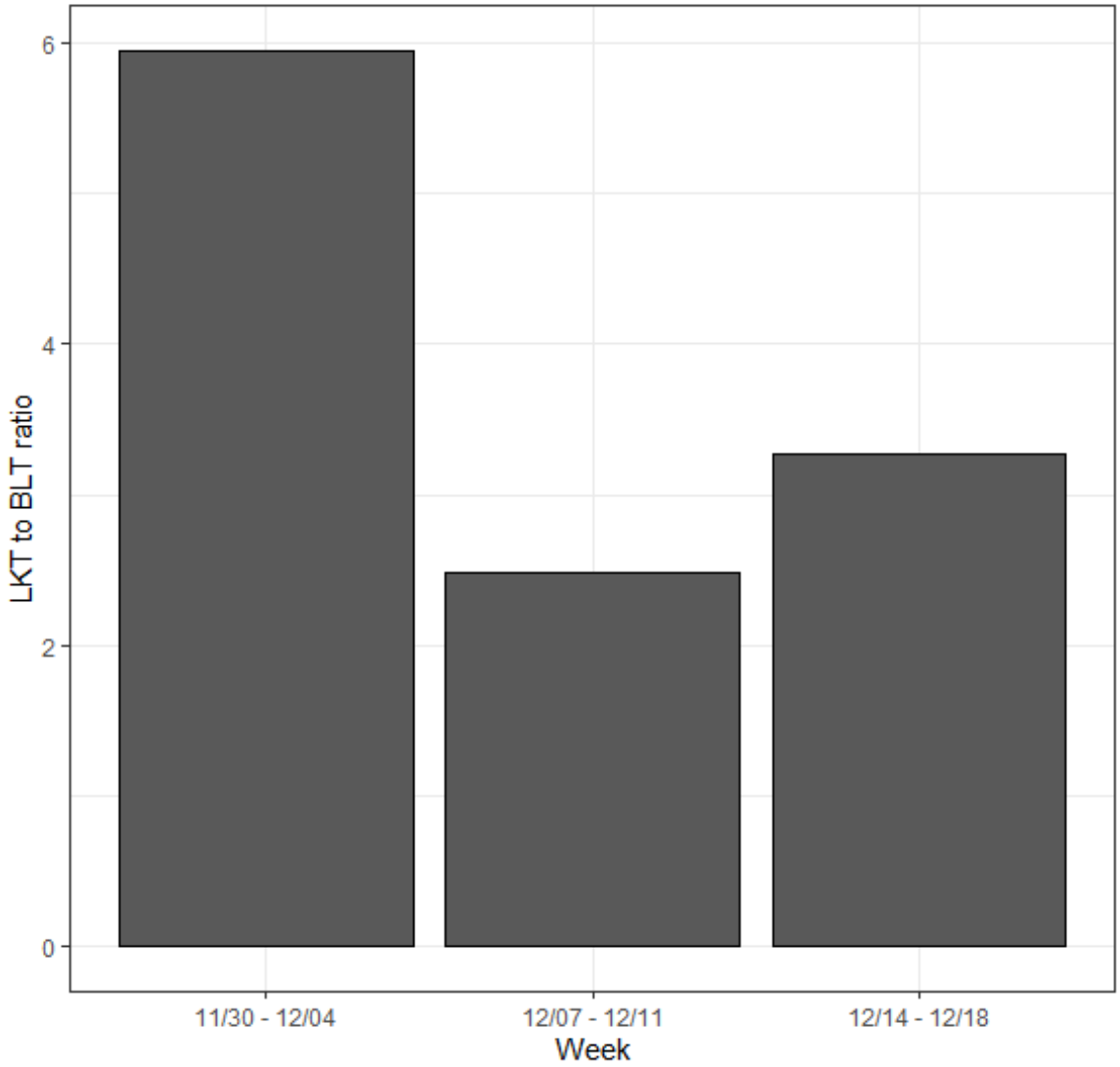

Figure 9: Mean weekly Lake Trout to Bull Trout catch ratios during the 2020 LKT assessment netting efforts.

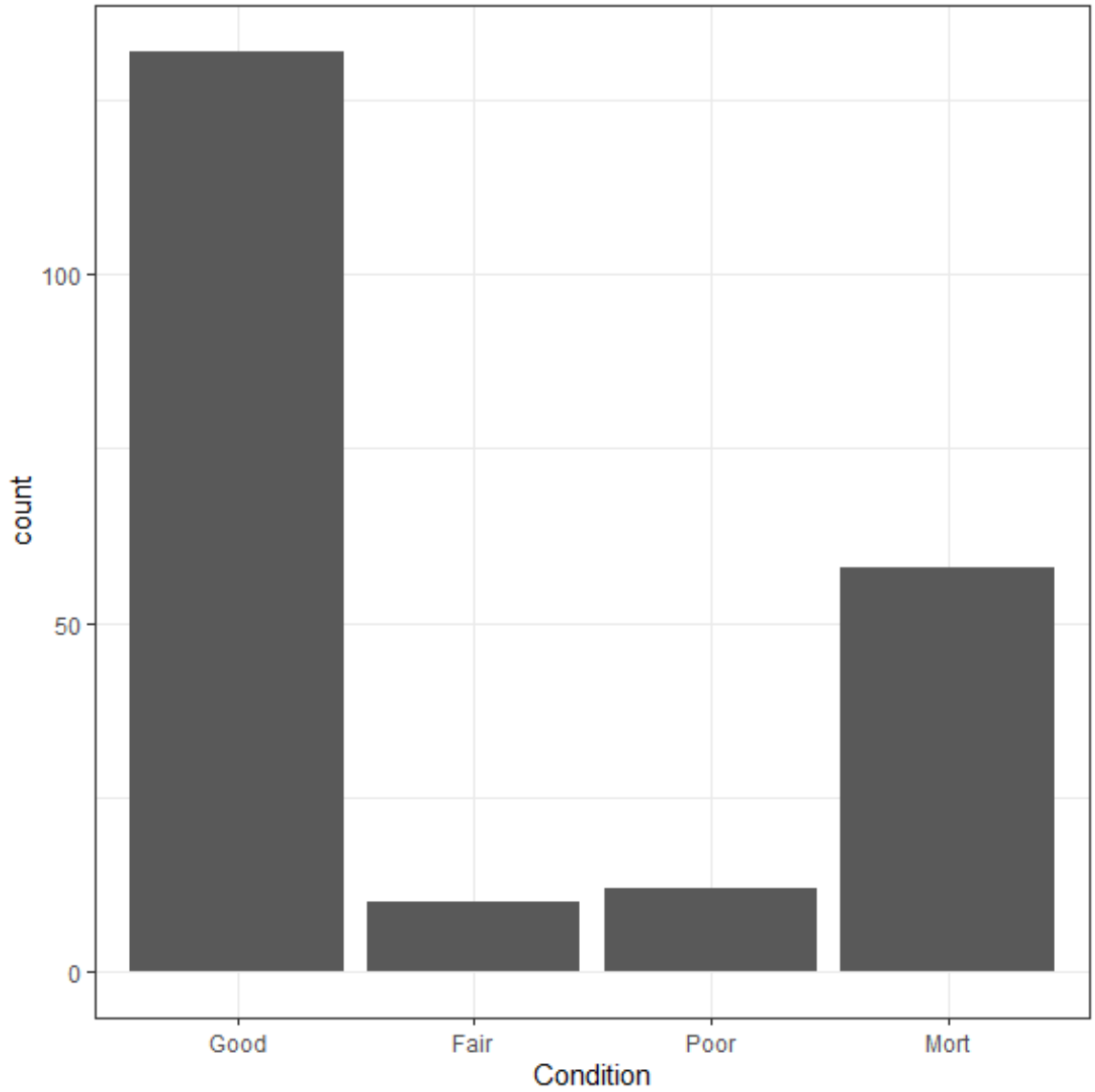

Figure 10: Condition index of Bull Trout captured during the 2020 LKT assessment netting efforts.

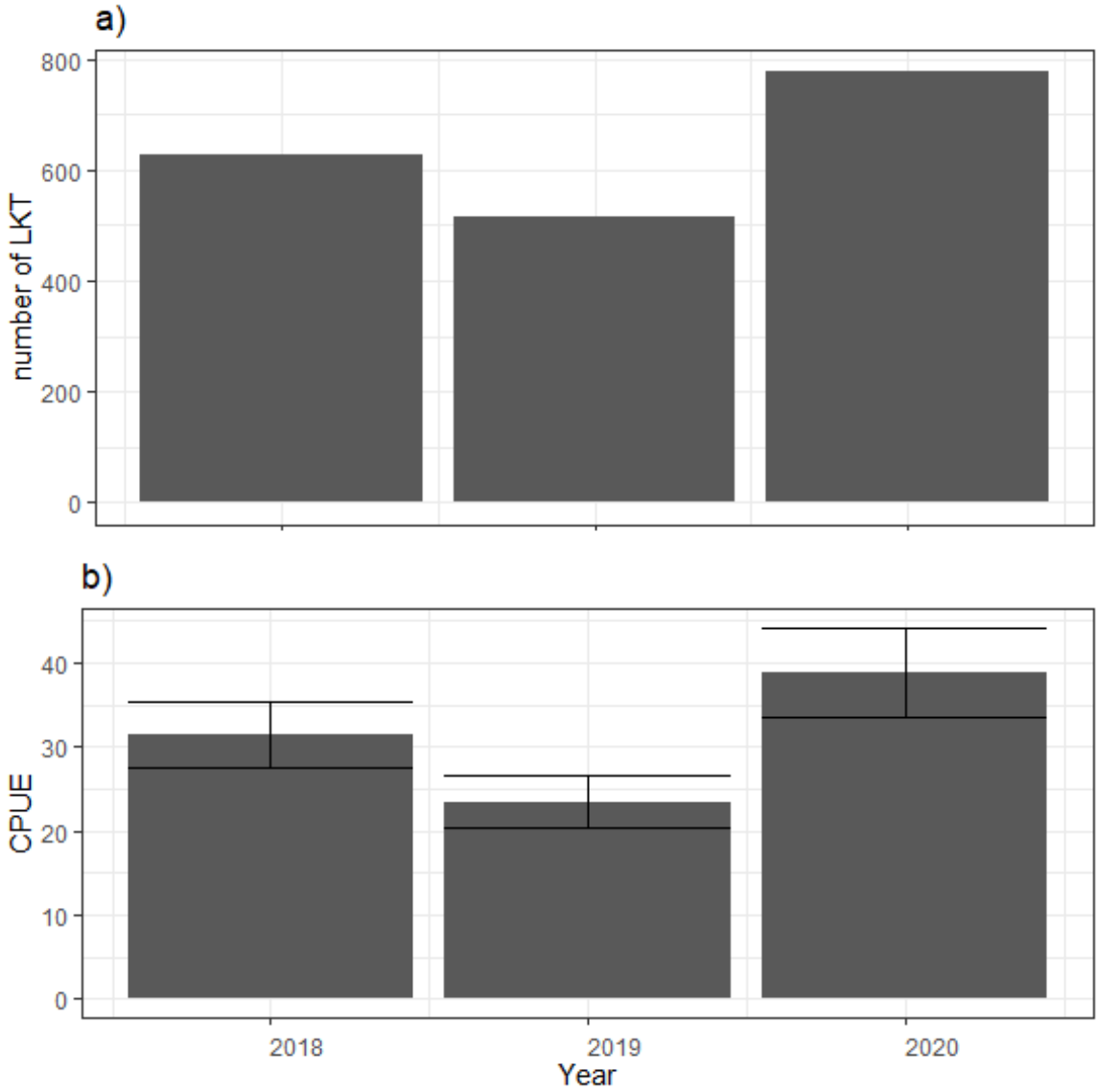

Figure 11: Annual catch (a) and mean catch per unit effort with standard error bars (b, # fish per 274m of gillnet) of Lake Trout during the designated LKT assessment netting efforts 2018–2020.

Figure 12: Map of Lake Pend Oreille showing the approximate locations and numbers of sexually mature kokanee captured as bycatch during the 2020 LKT assessment netting.

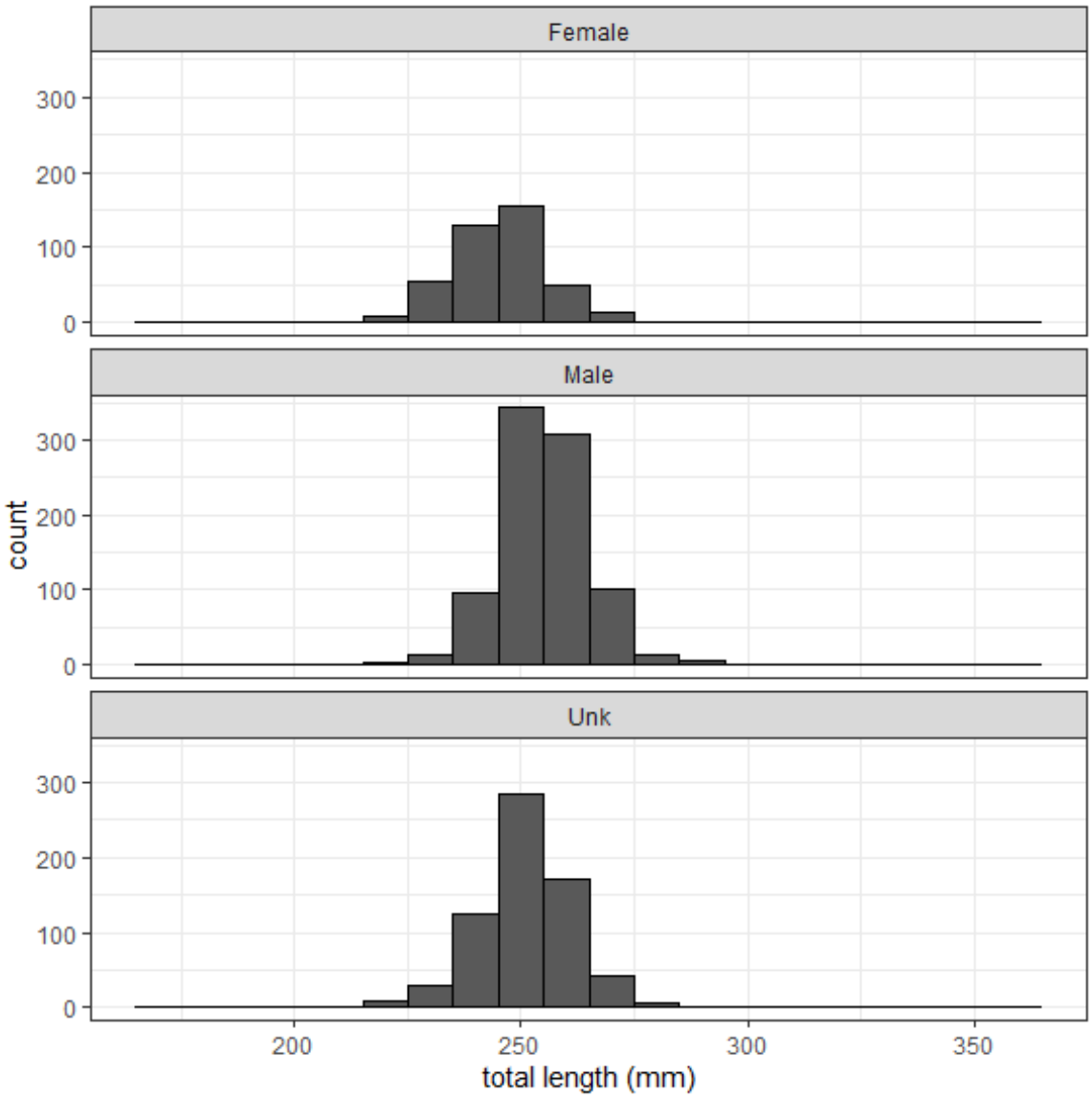

Figure 13: Length frequency distributions of spawning kokanee captured as bycatch during the 2020 LKT assessment netting. The bottom panel shows the length frequency for kokanee where sex was not recorded.

APPENDIX D: 2020 LPO LAKE TROUT ANGLER INCENTIVE PROGRAM SUMMARY

January 1–December 31, 2020

Total Lake Trout heads submitted = 2,641

Total Bull Trout heads submitted = 3

Total unique anglers participating = 206

Tables

Table 1. Number of Lake Trout removed through the Lake Pend Oreille, Idaho, Angler Incentive Program (AIP).

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2006	--	--	--	--	1,317	2,136	1,033	2,200	1,755	1,689	661	250	11,041
2007	415	789	895	1,261	2,445	3,107	2,809	1,949	1,864	1,046	831	254	17,665
2008	216	241	363	544	771	2,117	2,612	1,878	2,178	862	940	298	13,020
2009	144	156	179	263	1,033	1,321	1,178	1,051	969	409	483	180	7,366
2010	330	351	380	343	873	1,558	1,354	988	1,261	766	330	206	8,740
2011	146	78	105	256	347	2,049	1,115	718	940	930	348	292	7,324
2012	140	103	96	233	928	1,552	1,534	977	1,119	419	388	324	7,813
2013	121	115	95	163	359	468	677	396	454	315	232	158	3,553
2014	85	47	40	90	300	480	361	354	297	130	191	135	2,510
2015	19	47	45	74	257	326	526	660	477	438	217	108	3,194
2016	36	84	63	97	313	491	417	525	322	213	248	62	2,871
2017	42	79	25	186	386	574	775	697	387	193	140	47	3,531
2018	106	21	48	140	135	315	530	391	424	272	156	80	2,618
2019	51	46	27	27	143	286	287	183	246	221	109	134	1,760
2020	107	71	72	37	158	367	470	501	271	319	155	113	2,641
Total													95,647

Figures

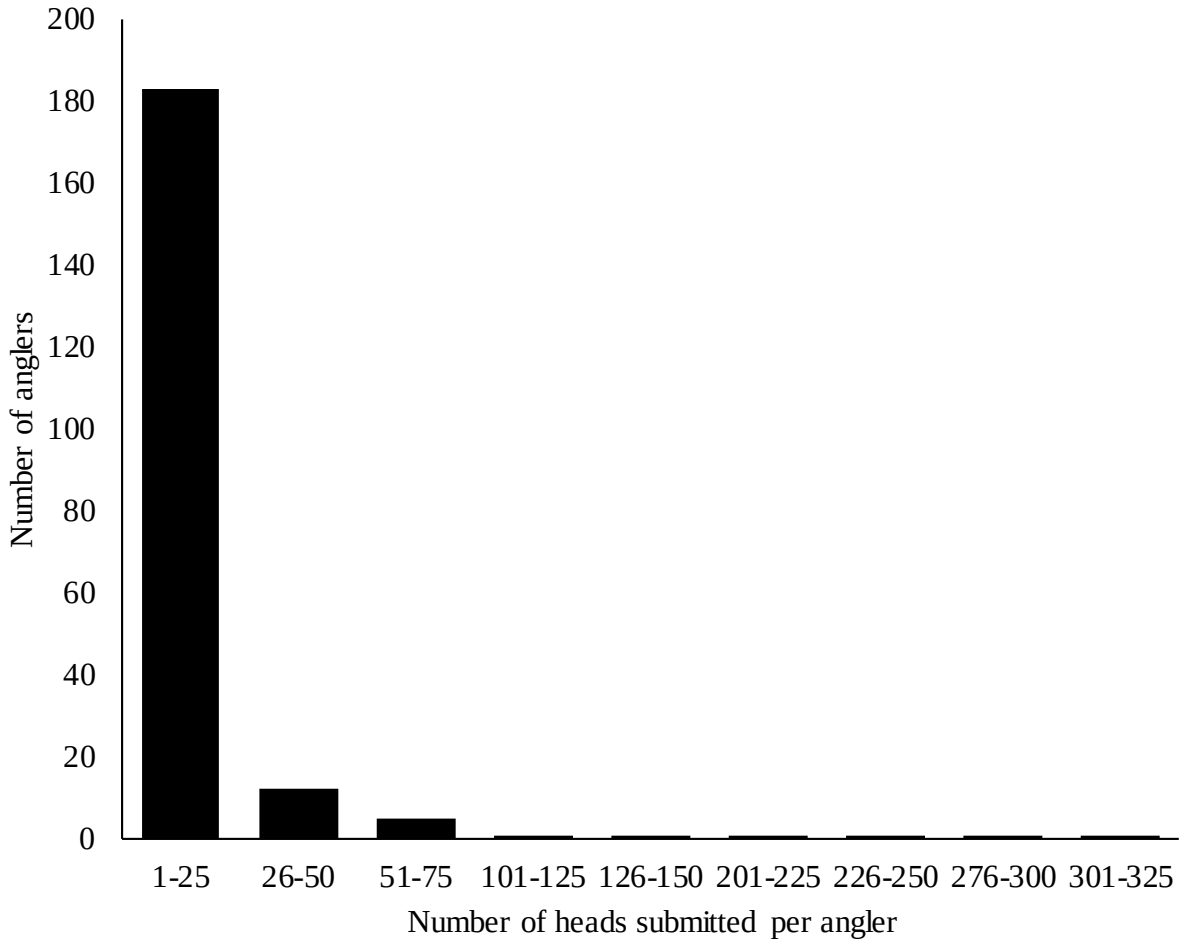

Figure 1. Number of Lake Trout anglers that submitted a certain number of heads through the Lake Pend Oreille, Idaho, AIP during 2020.

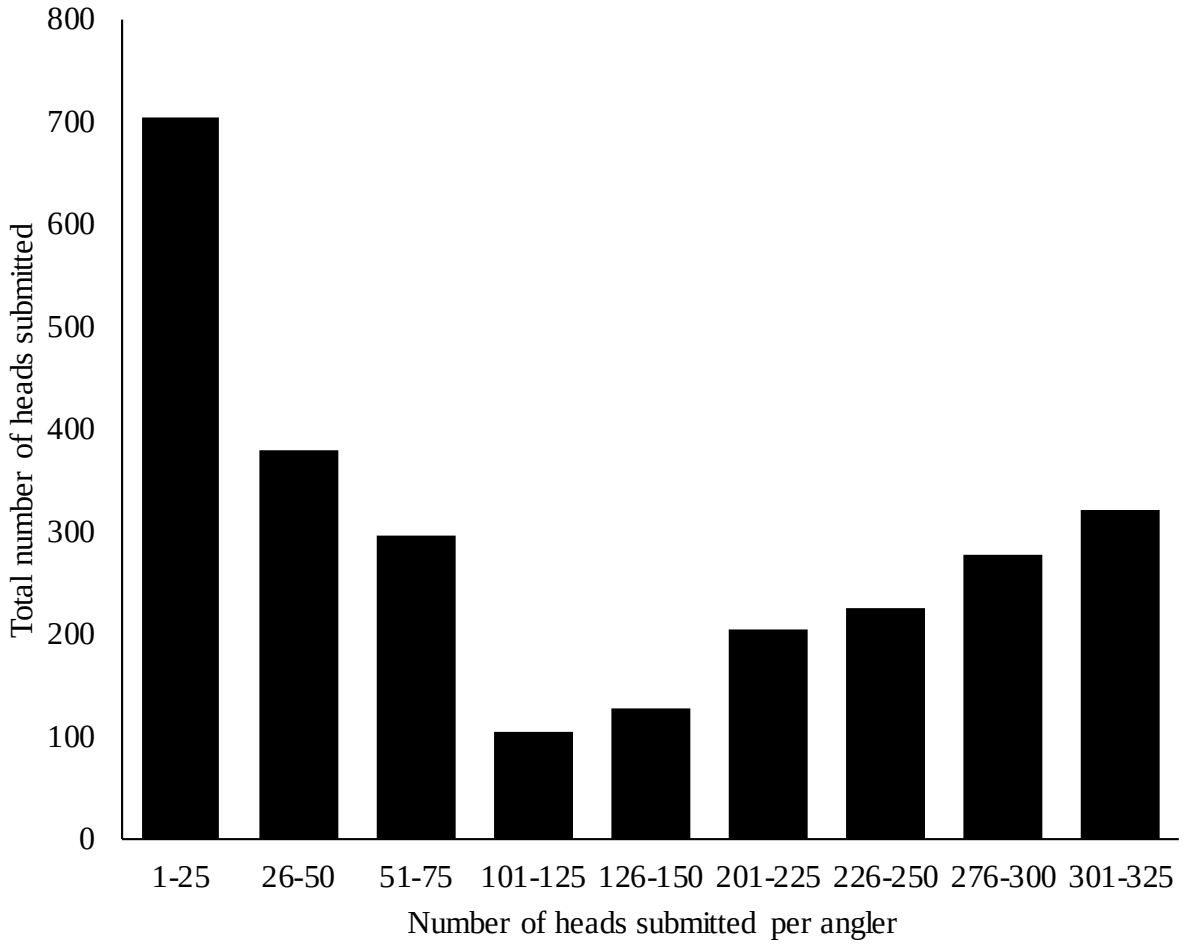

Figure 2. Total number of Lake Trout heads submitted by anglers that submitted a certain number of heads through the Lake Pend Oreille, Idaho, AIP during 2020.

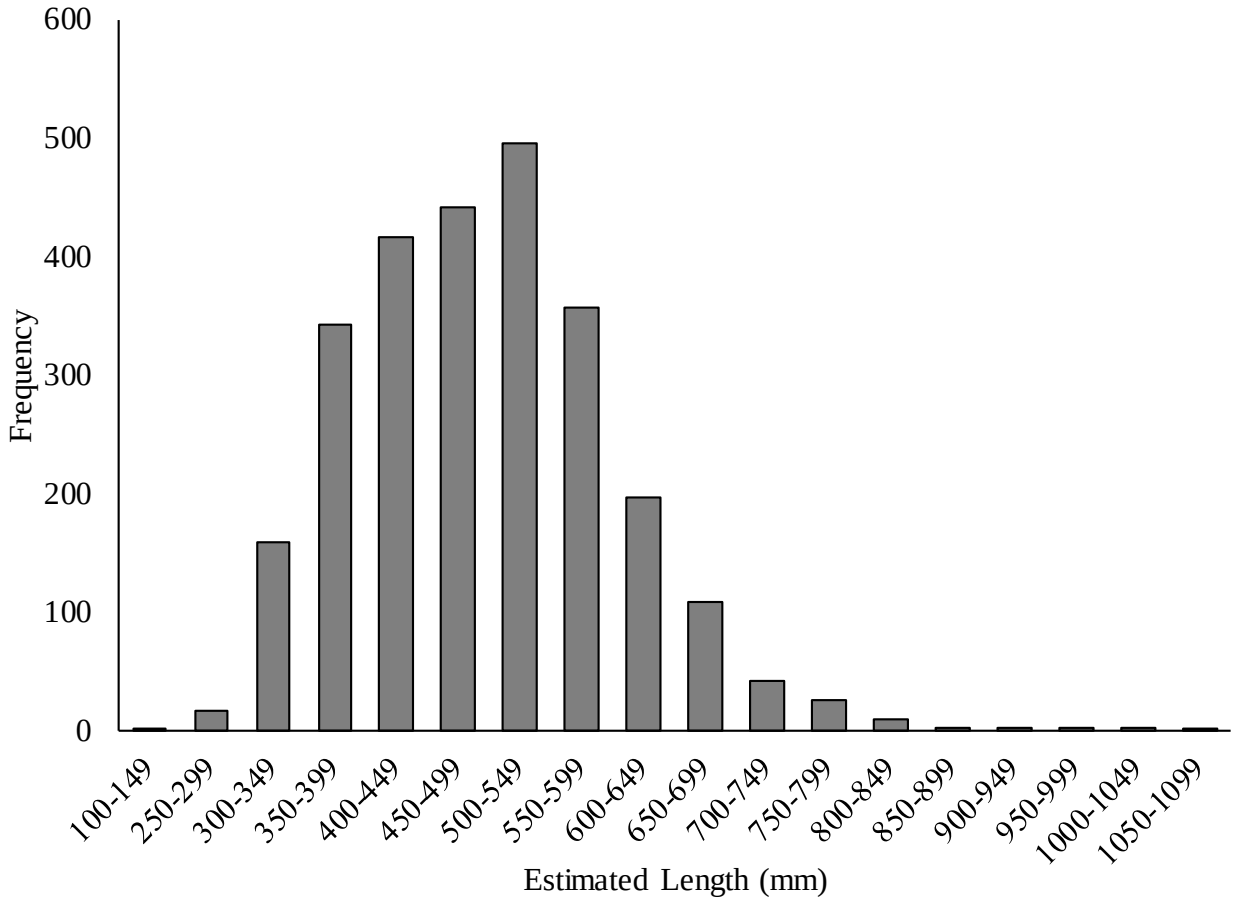

Figure 3. Length frequency of estimated total length of Lake Trout captured by anglers participating in the AIP during 2020. Estimated lengths were derived using a head length to total length regression formula, developed from Lake Trout captured by the LPO Predator Suppression Program on Lake Pend Oreille, Idaho.

APPENDIX E: SPRING 2020 WALLEYE NETTING SUMMARY
April 13–May 1, 2020

Spring 2020 Gillnet Basic Information:

Total effort (number of 274.32 m nets) = 180

Walleye captured = 576

- Walleye removed = 547
- Walleye recaptures = 7

Bull Trout captured = 52

- Bull Trout mortalities = 15
- Bull Trout recaptures = 11
    - 11 PIT tags
        - 11 HDX
        - 5 mortalities (included above)
        - 9 released alive
- Bull Trout tagged and released = 19
    - 19 HDX PIT tagged and released
    - 18 good condition "3"
    - 1 fair condition "2"
    - 0 poor condition "1"

Mean daily CPUE Walleye (number per 274.32 m net) = 3.20 (±0.89 SE)

Mean daily CPUE Bull Trout (number per 274.32 m net) = 0.28 (±0.16 SE)

Tables

Table 1. Species caught and removed in gillnets during spring 2020 WAE netting efforts.

Species	Number Caught	Number Released	Number Removed
Walleye	576	29	547
Black Crappie	24	24	0
Brown Trout	31	30	1*
Bull Trout	52	37	15*
Cutthroat Hybrid	0	0	0
Lake Trout	87	0	87
Largemouth Bass	2	2	0
Northern Pike	68	0	68
Rainbow Trout	45	43	2*
Smallmouth Bass	349	349	0
Westslope Cutthroat Trout	70	68	2*
Yellow Perch	108	108	0
* = dead on capture			

Table 2. Species caught in gillnets by location in spring 2020 netting efforts.

Location	Map Area	Black Crappie	Brown Trout	Bull Trout	Cutthroat Hybrid	Lake Trout	Largemouth Bass	Northern Pike	Rainbow Trout	Smallmouth Bass	Walleye	Westslope Cutthroat Trout	Yellow Perch
Clark Fork Delta		3	3	2	0	3	0	2	3	12	16	1	0
Fisherman Island		2	5	6	0	13	0	5	3	22	60	13	15
Kootenai Point		5	7	1	0	9	0	19	0	36	18	1	61
Owens Bay		0	2	14	0	4	0	2	1	4	14	1	1
Sandpoint City Beach		0	1	0	0	15	0	0	0	18	12	0	6
Sheepherder		4	2	9	0	1	0	2	9	10	45	1	0
Sourdough Point		0	0	2	0	10	0	0	0	15	2	0	3
Sunnyside		1	2	5	0	9	1	7	4	50	27	5	12
Train Bridge		0	0	0	0	4	0	0	0	9	42	1	0
Pack Delta		9	9	13	0	19	1	31	25	173	340	47	10

Table 3. Total length details of Walleye and Bull Trout caught in gillnets in Lake Pend Oreille during spring 2020.

	Walleye	Bull Trout	Bull Trout Mortalities
Avg. Length (mm)	548 (±3.4)	534 (±10.9)	543 (±16.7)
Min. Length (mm)	325	395	445
Max. Length (mm)	810	710	670

Table 4. Gillnet mesh size (in.) comparison of Walleye and Bull Trout catches in Lake Pend Oreille during spring 2020.

Mesh Size (in.)	WAE	BLT	BLT Morts	Effort (274.3 m nets)	Mean WAE CPUE (±SE)	Mean BLT CPUE (±SE)	WAE:BLT	WAE:BLT Morts	% BLT Morts
3.5	143	25	8	60	2.38 (±0.81)	0.42 (±0.11)	5.72	17.88	32.00%
4.0	234	18	6	60	3.90 (±1.30)	0.30 (±0.12)	13.00	39.00	33.33%
4.5	199	9	1	60	3.32 (±0.78)	0.15 (±0.06)	22.11	199.00	11.11%
Total	576	52	15	180	3.20 (±0.96)	0.26 (±0.09)	13.61	85.29	25.48%

Figures

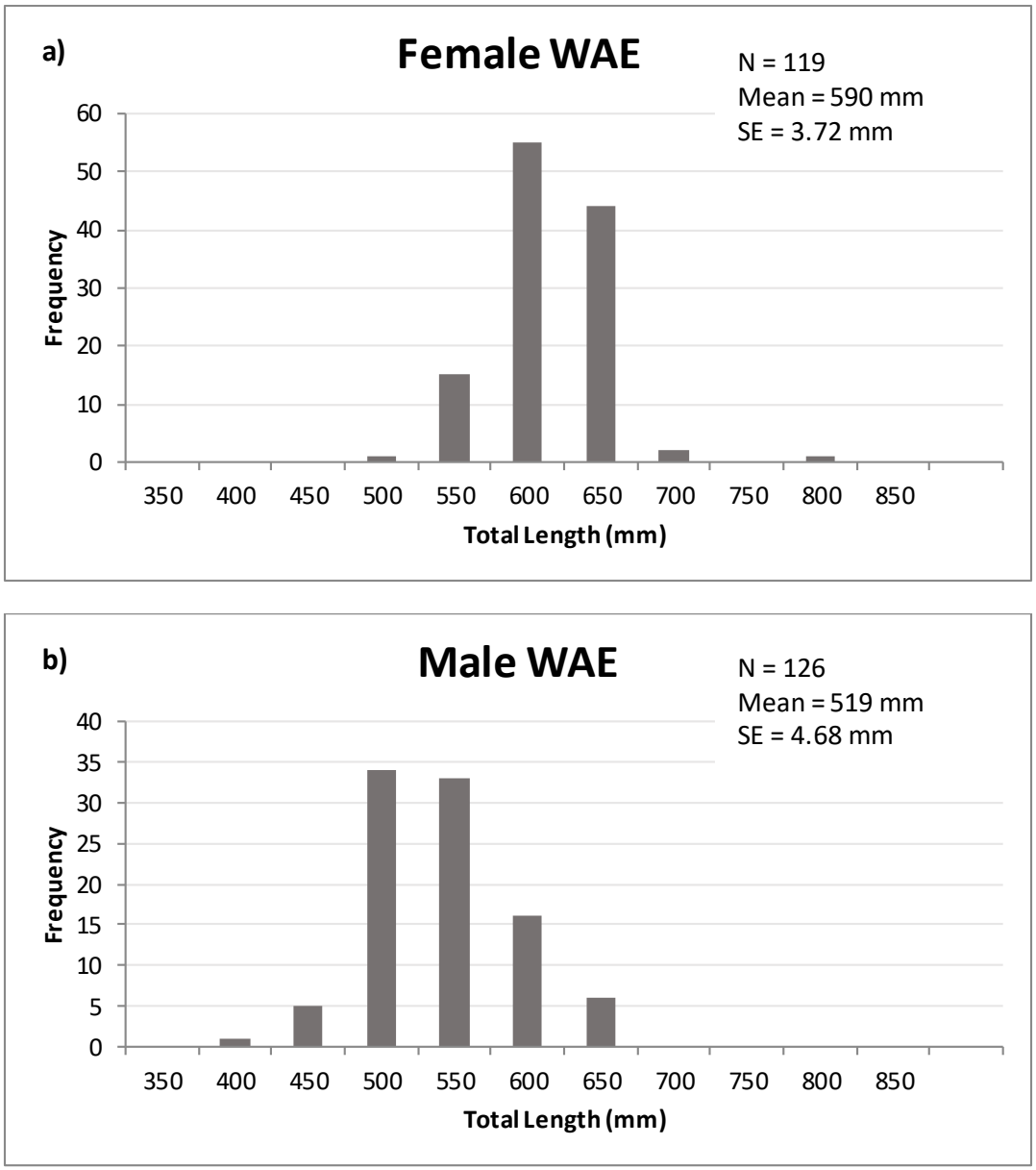

Figure 1. Length-frequency of female (a) and male (b) Walleye captured in gillnets in Lake Pend Oreille during spring 2020.

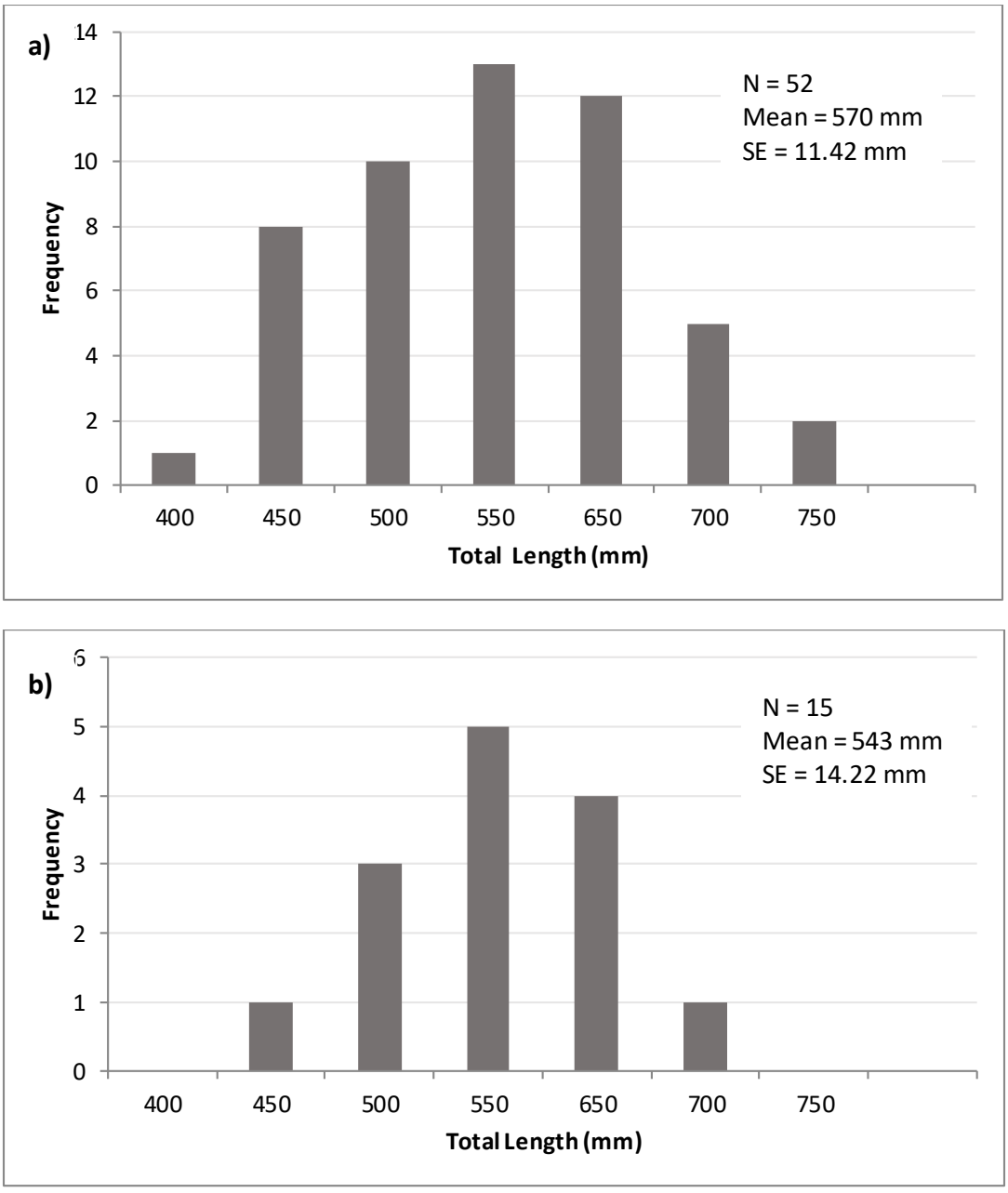

Figure 2. Length-frequency of Bull Trout captured (a) and Bull Trout mortalities (b) in gillnets during spring 2020 Walleye netting efforts in Lake Pend Oreille.

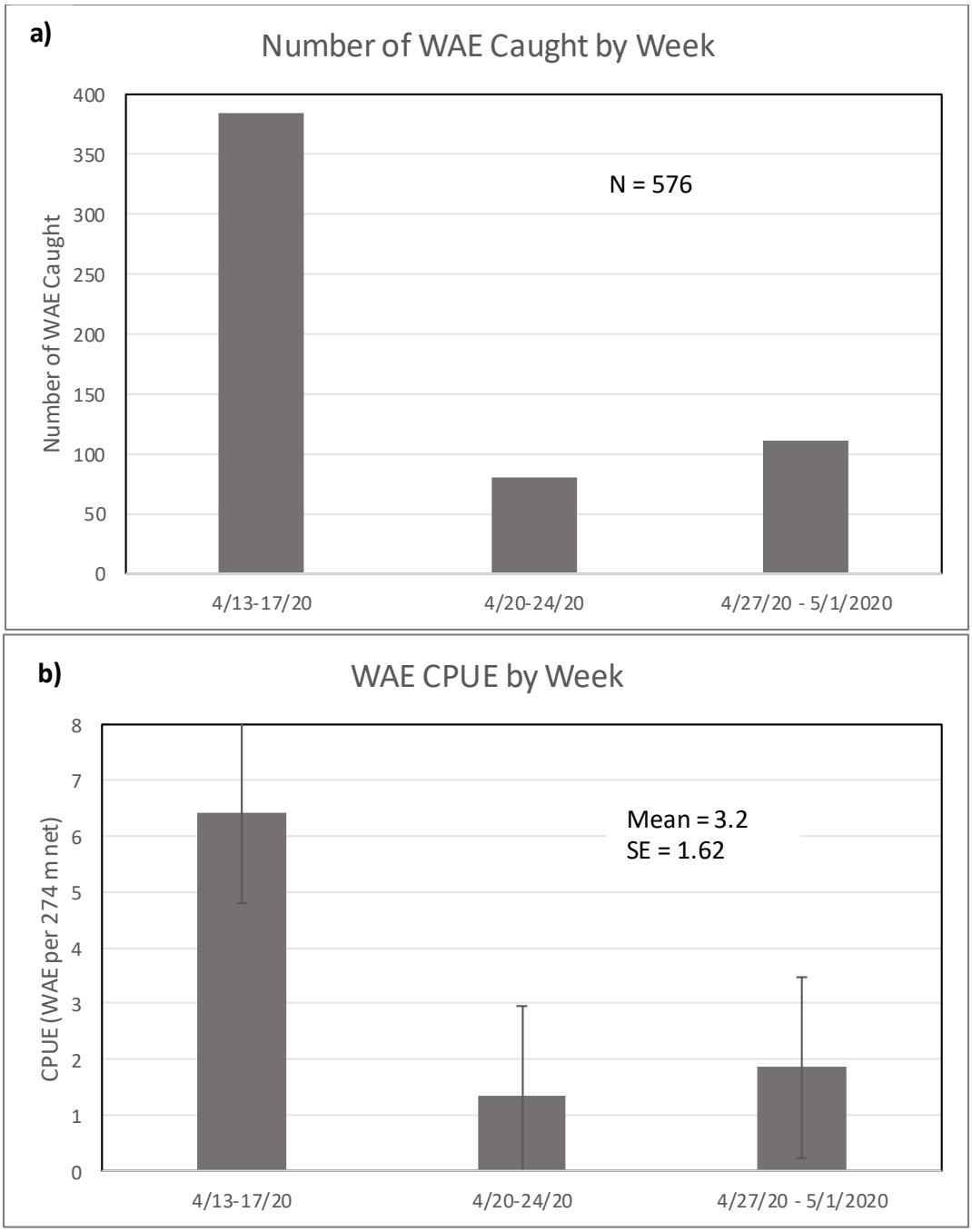

Figure 3. Weekly catch (a) and mean (±SE) weekly catch per unit effort (b) of Walleye captured in gillnets during spring 2020 Walleye netting efforts in Lake Pend Oreille.

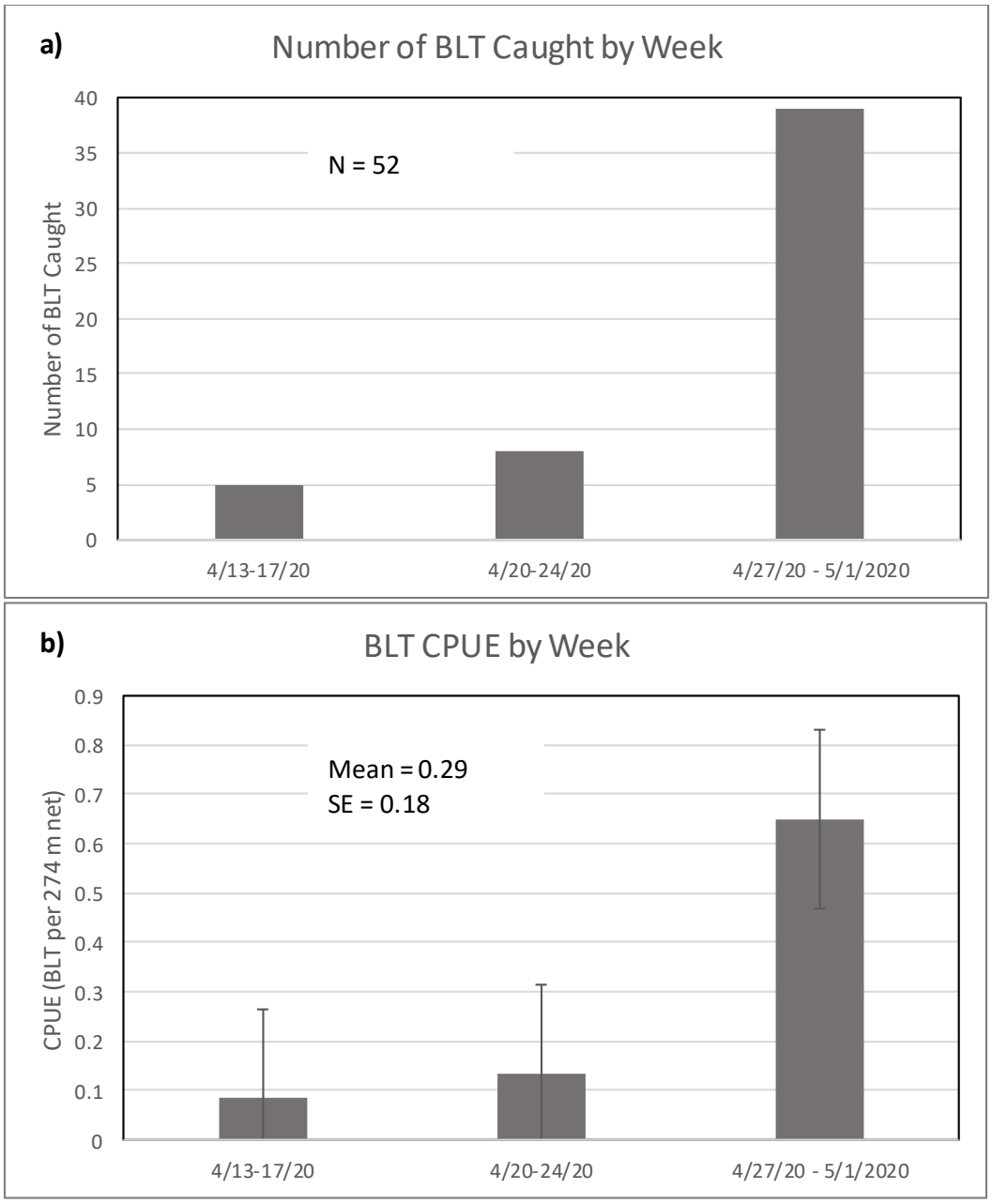

Figure 4. Weekly catch (a) and mean (±SE) weekly catch per unit effort (b) of Bull Trout captured in gillnets during spring 2020 Walleye netting efforts in Lake Pend Oreille.

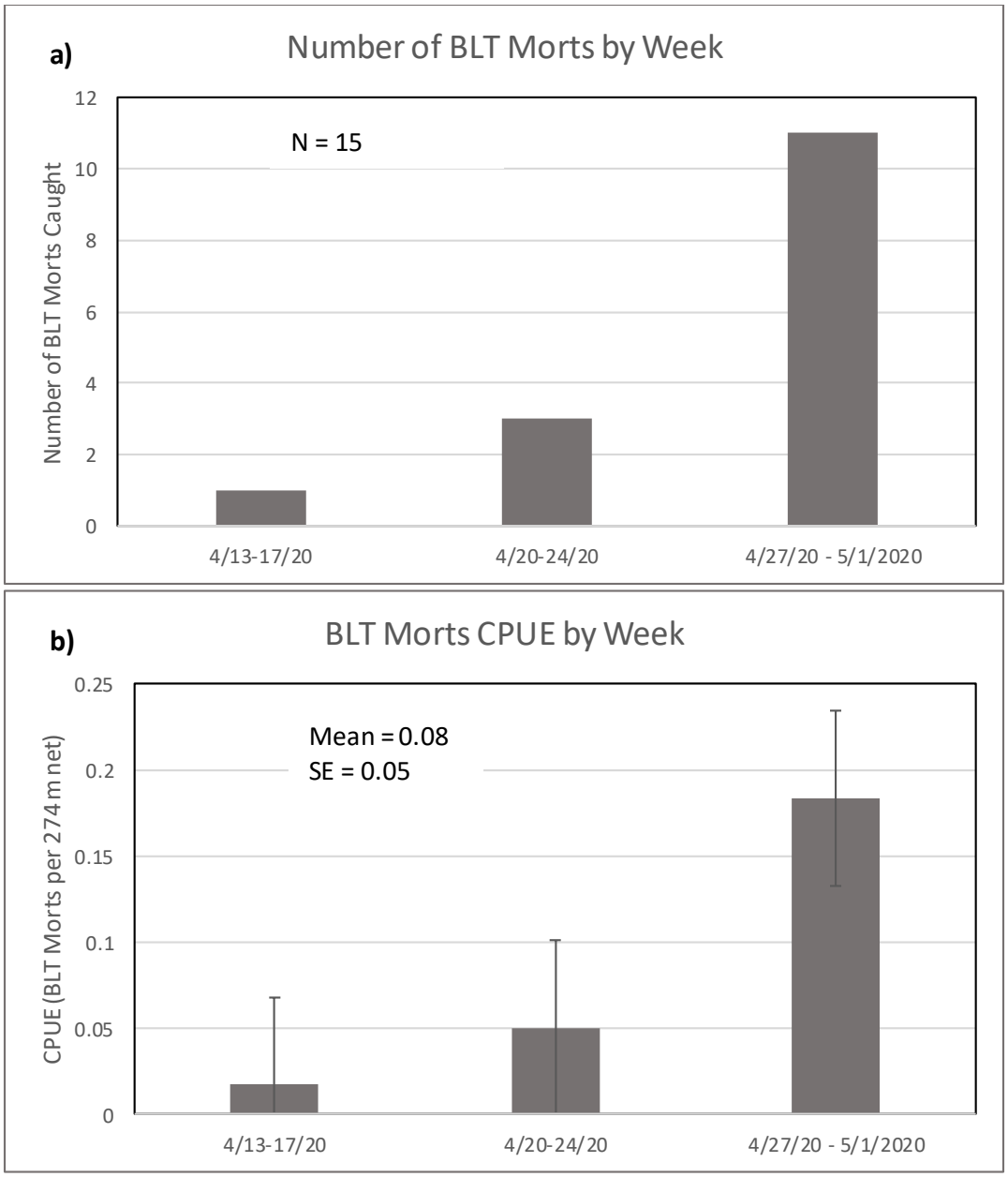

Figure 5. Weekly catch (a) and mean (±SE) weekly catch per unit effort (b) of Bull Trout mortalities in gillnets during spring 2020 Walleye netting efforts in Lake Pend Oreille.

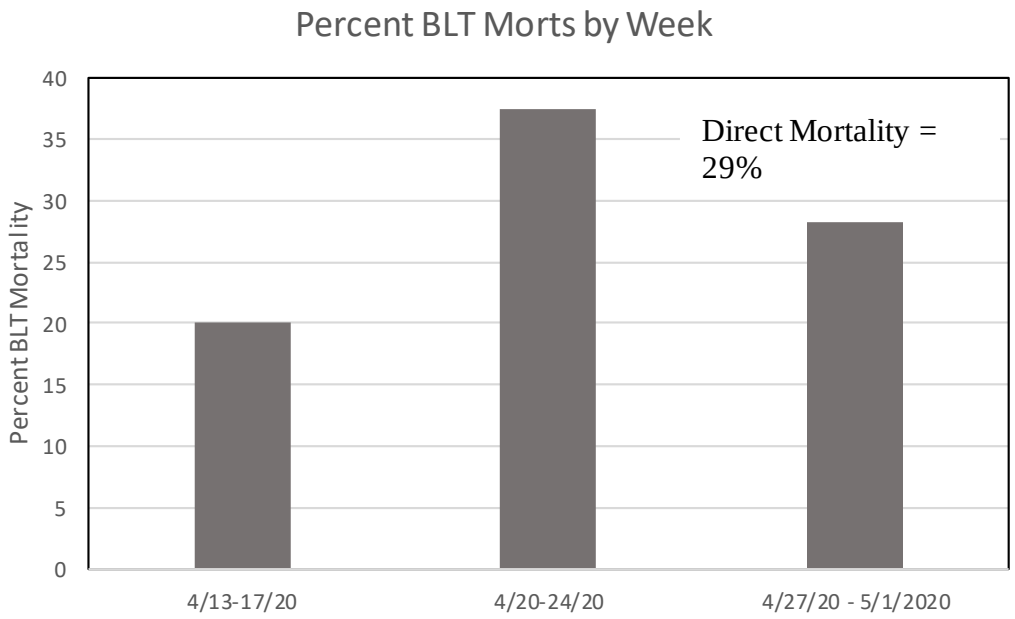

Figure 6. Weekly Bull Trout percent mortality in gillnets during spring 2020 Walleye netting efforts in Lake Pend Oreille.

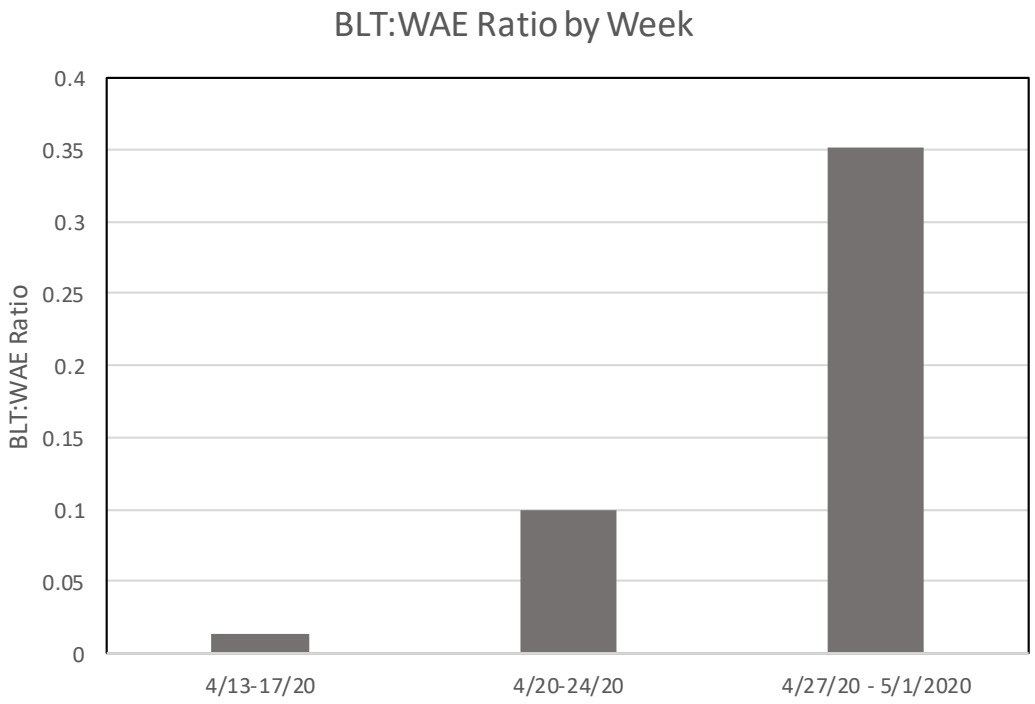

Figure 7. Weekly Bull Trout to Walleye catch ratios in gillnets during spring 2020 Walleye netting efforts in Lake Pend Oreille.

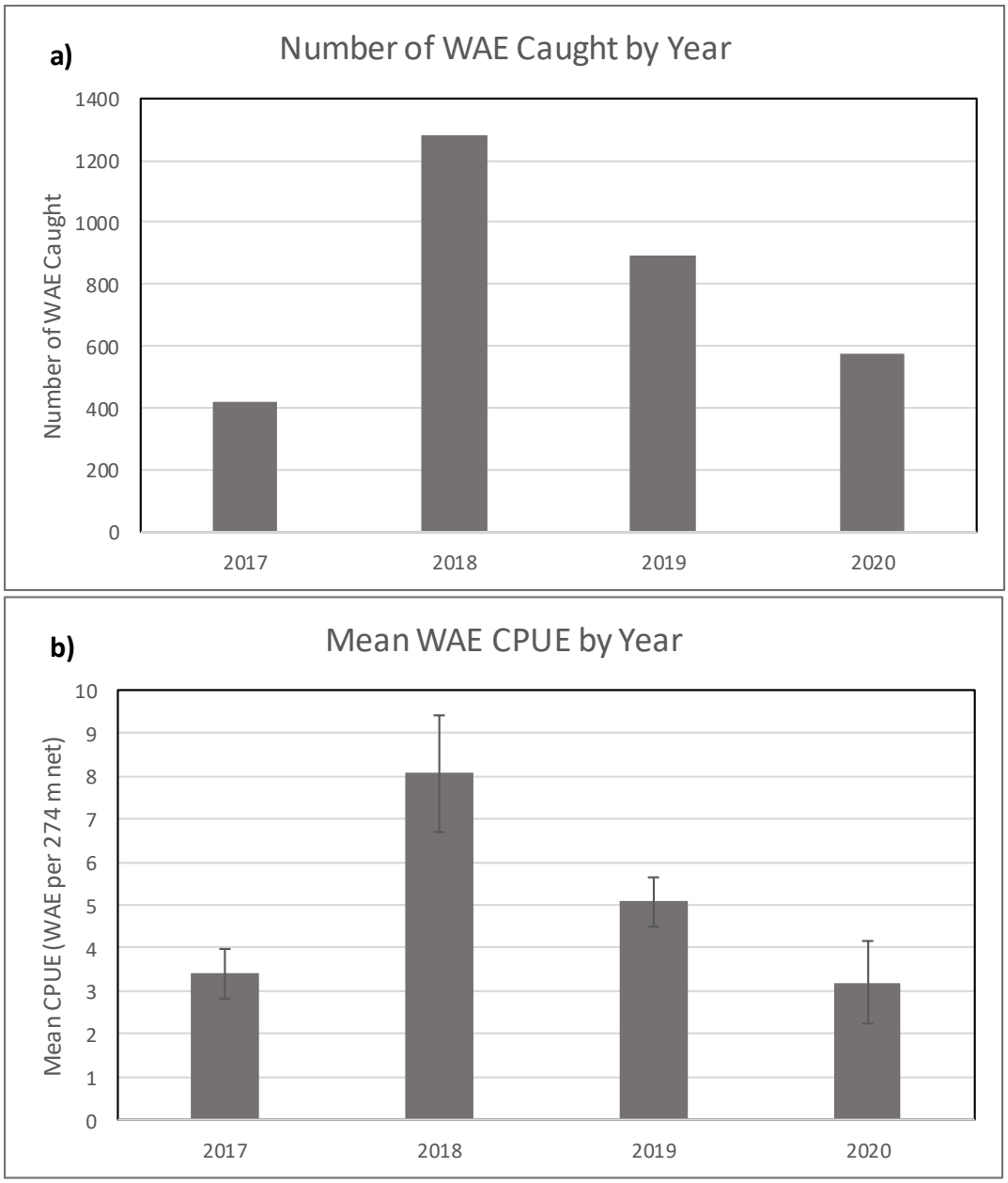

Figure 8. Total gillnet catch (a) and mean (±SE) yearly catch per unit effort (b) of Walleye captured in Lake Pend Oreille, during spring Walleye netting, 2017–2020.

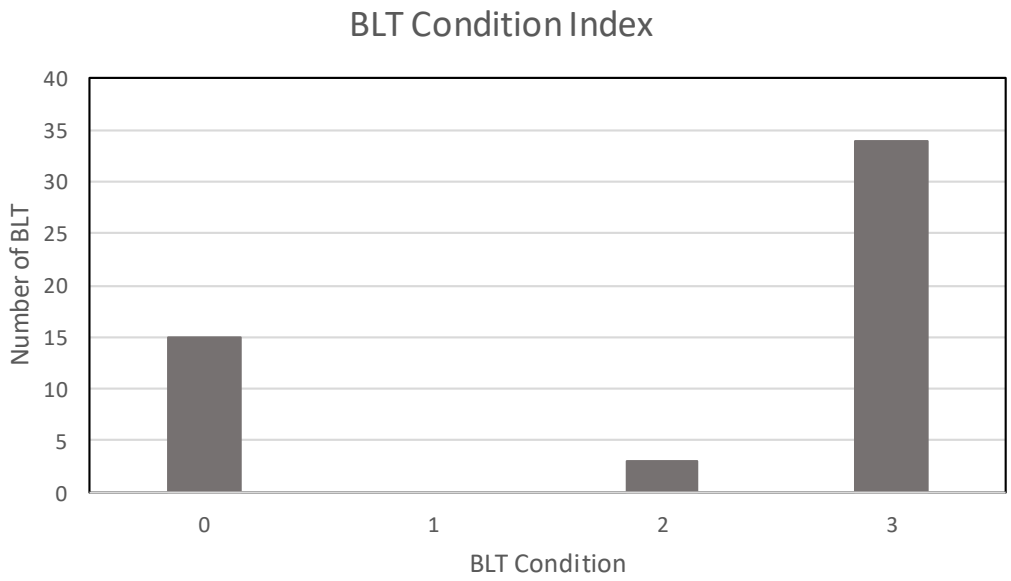

Figure 9. Condition index of Bull Trout captured in gillnets during spring 2020 Walleye netting efforts in Lake Pend Oreille. Condition indexes are as follows: 0 = Mortality; 1 = Poor (fish is not orienting, may be bleeding, respiration is shallow); 2 = Fair (fish is "tired" but orienting and breathing normal); 3 = Good (fish is vigorous and struggles to escape).

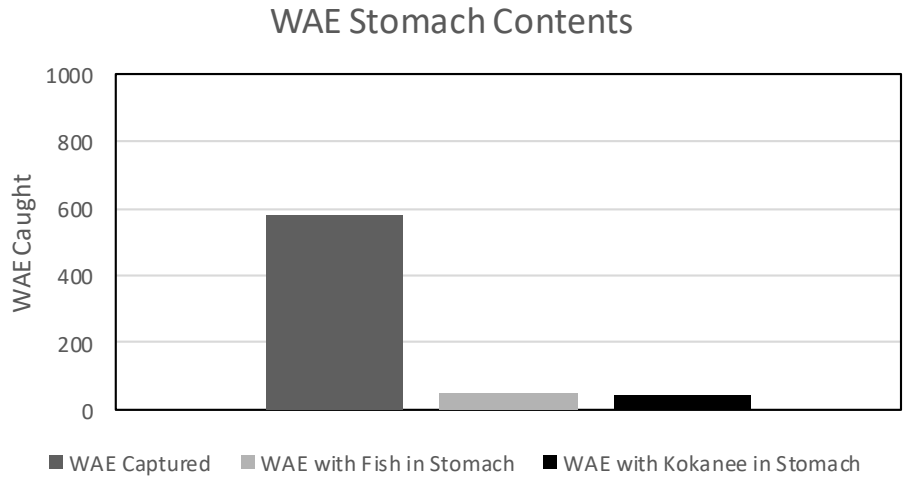

Figure 10. Total number of Walleye caught in gillnets and their stomach contents during spring 2020 Walleye netting efforts in Lake Pend Oreille, ID.

APPENDIX F: 2020 LPO WALLEYE ANGLER INCENTIVE PROGRAM SUMMARY

Total Walleye heads submitted = 860

Total unique anglers participating = 183

Table 1. Number of Walleye removed through the Lake Pend Oreille Idaho, Angler Incentive Program (AIP), by month 2019–2020.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
2019			26	89	79	154	156	171	76	18	9	7	785
2020	12	17	60	53	71	121	137	206	130	25	14	14	860

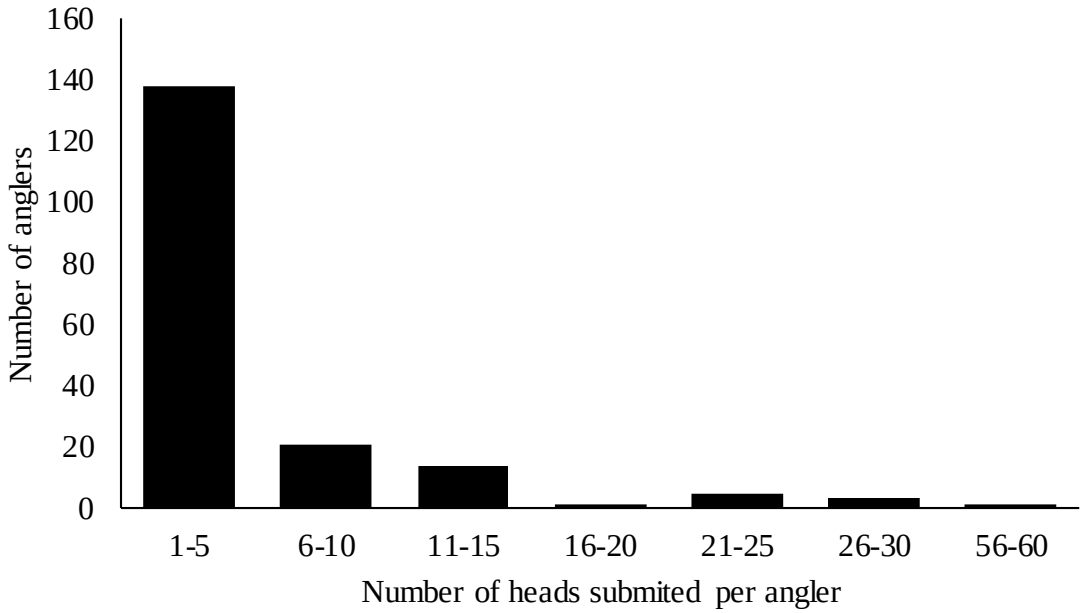

Figure 1. Number of Walleye anglers that submitted a certain number of heads through the Lake Pend Oreille, AIP during 2020.

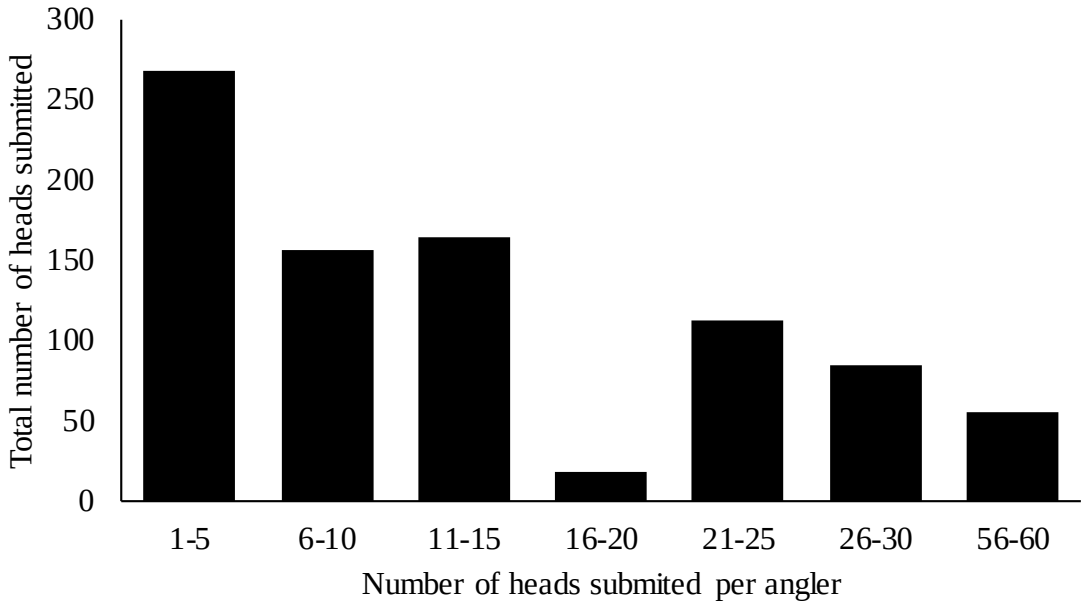

Figure 2. Total number of Walleye heads submitted by anglers that submitted a certain number of heads through the Lake Pend Oreille AIP during 2020.

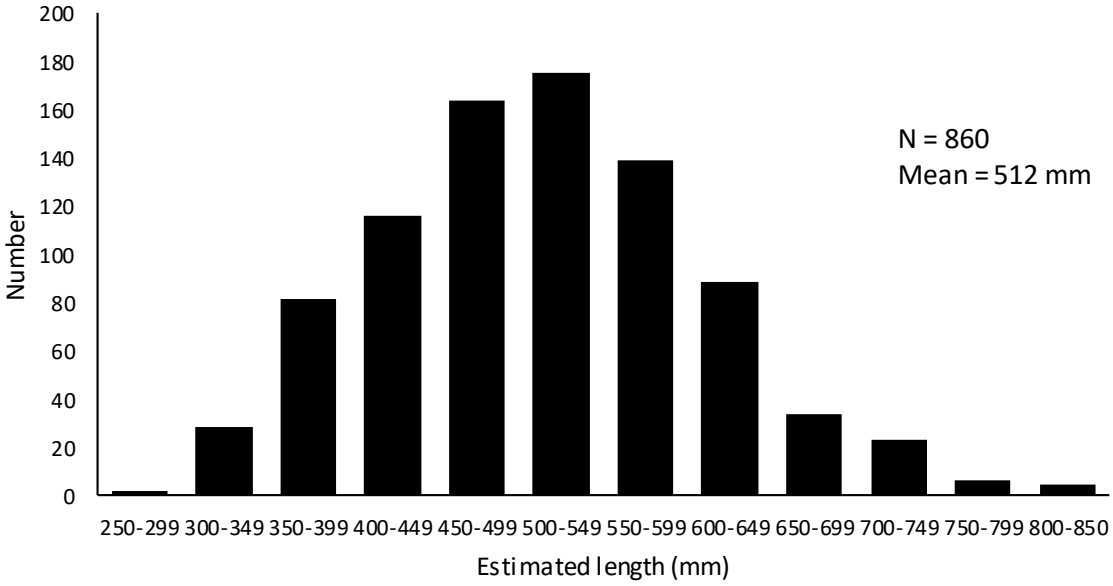

Figure 3. Estimated total length of Walleye captured by anglers participating in the AIP during 2020. Estimated lengths were derived using a head length to total length regression formula, developed from Walleye captured by the LPO Predator Suppression Program on Lake Pend Oreille.

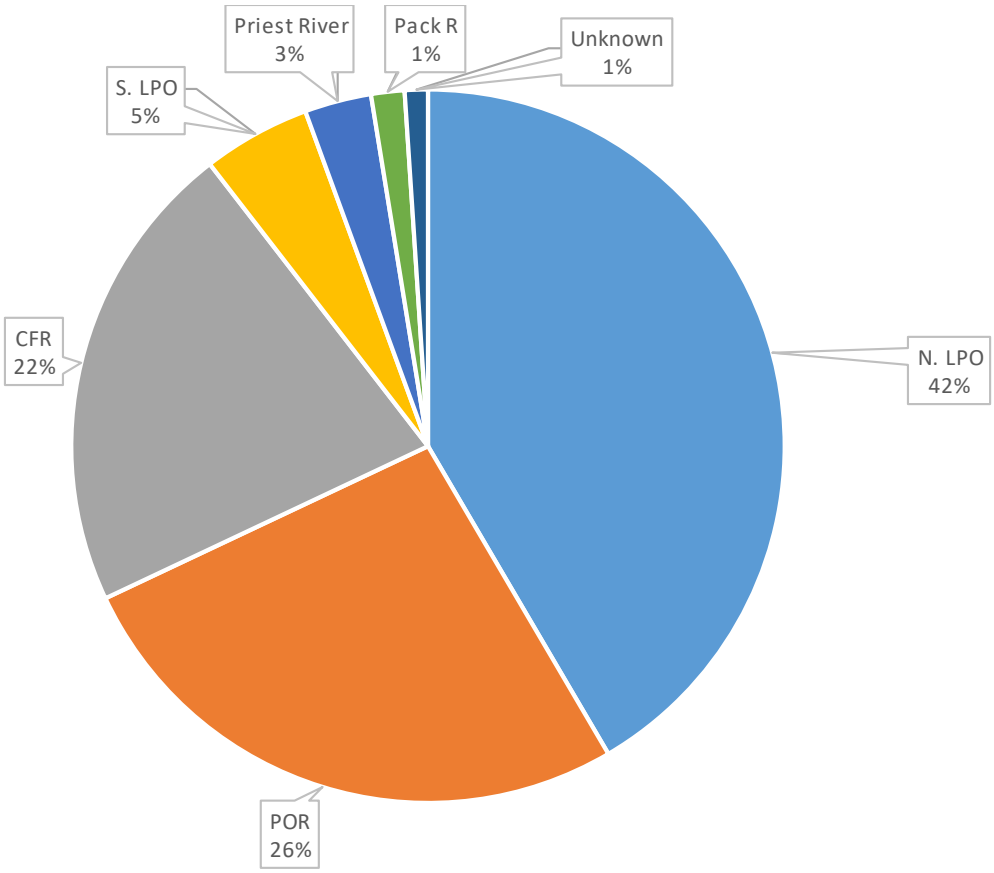

Figure 4. Locations where Walleye were reported to have been caught, as a percentage of the total, by anglers participating in the Walleye AIP, 2020.

APPENDIX G: 2020 FALL WALLEYE INDEX NETTING SUMMARY

Table 1. Catch data from the 2020 FWIN survey.

Species	Total Catch	Catch per net	
		AVG	SD
Yellow Perch	308	6.4	13
Peamouth Chub	229	4.8	7.1
Lake Whitefish	211	4.4	6
Smallmouth Bass	199	4.1	4.8
Northern Pikeminnow	131	2.7	3.2
Walleye	119	2.5	2.8
Large Scale Sucker	96	2	2.9
Brown Bullhead	51	1.1	4.6
Tench	49	1	2.1
Black Crappie	39	0.8	2.4
Long Nose Sucker	32	0.7	1.4
Northern Pikeminnow	19	0.4	0.8
Mountain Whitefish	16	0.3	0.6
Pumpkinseed	11	0.2	0.8
Large Mouth Bass	10	0.2	1.2
Rainbow Trout	10	0.2	0.6
Westslope Cutthroat Trout	7	0.1	0.5
Brown Trout	5	0.1	0.4
Bull Trout	2	0	0.2
kokanee	1	0	0.1

Table 2. Walleye information from the 2020 FWIN survey.

Indices - Walleye	Value
Catch	119
CPUE	2.5
CPUE SD	2.8
Min TL	187 mm
Max TL	758 mm
Mean TL	434 mm
Wr	93.9
PSD	55
Visceral Fat Index - Male	2.8
Visceral Fat Index - Female	4.1
Mean TL @ Age-2 - Male	374 mm
Mean TL @ Age-2 - Female	432 mm
Female Diversity Index (H)	0.64
Age @ 50% Maturity A_{50} - Male	1.6
Age @ 50% Maturity A_{50} - Female	3